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U.S. DEPARTMENT OF COMMERCE Malcolm Baldrige, Secretary of Commerce
NATIONAL TECHNICAL INFORMATION SERVICE

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GOVERNMENT REPORTS

Announcements & Index

Volume 82, Number 6 March 12, 1982

CONTENTS

About NTIS & How To Order ii
How To Use iii
Subject Category and Subcategory Structure iv
NTIS Products v
Reports Announcements 1075
Keyword Index KW-1
Personal Author Index PA-1
Corporate Author Index CA-1
Contract/Grant Number Index CG-1
NTIS Order/Report Number Index OR-1
Price Codes ..... Outside Back Cover

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SAMPLE ENTRY

Field 12—MATHEMATICAL SCIENCES
Group 12A—Mathematics and Statistics
PB80-104045 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Constructed Facilities Div.
Computation of Hankel Transforms Using the Fast-Fourier Transform Algorithm,
E. Kausel, and G. Bouckovalas. Aug 79, 49p
R79-12, NSF/RA-79-12, NSF/RA-790206
Grant NSF-ENV77-18339

An efficient numerical procedure is presented for the computation of Hankel Transforms. The algorithm is based on the expression of the Hankel Transform in terms of a two-dimensional Fourier Transform, which is then reduced to only one dimension. The latter is then evaluated with the Fast Fourier Transform algorithm. Examples are presented, and a listing of the computer program included.

NTIS Subject Category
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Personal authors Report date Page count
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Abstract

1. AERONAUTICS

CONF-7810153- PC **A06**/MF **A01**
Activities at Argonne National Laboratory in Evaluating the Potential Toxicity of Effluents from Fluidized Bed Combustion of Coal. Appendix 1.
Aug 79,
Conference on fire particulate emmissions form fluid bed and conventional combustions, Washington, DC, USA, 23 Oct 1978.

It is concluded that: the effluent stream from the ANL PFBC contains appreciable quantities of mutagenic/cytotoxic organic materials. Much of this organic material is sufficiently volatile that it passes through the final filter which operates at a temperature of 150 to 170 exp 0 C. If this effluent stream were vented to the atmosphere at a temperature of approx. 150 exp 0 C (as typically occurs in coal burning power stations), the organic component could be expected to adsorb to the surfaces of the accompanying particulate material. This could, potentially, have a significant effect on the toxicity/carcinogenicity of the effluent. A portion of these mutagenic/cytotoxic materials are solubilized by proteins (e.g., serum). This observation is significant in assessments of potential toxicity of inhaled/ingested materials. The mutagenicity of the organic component of the effluent resides largely in the more polar fractions. The ANL bench-scale PFBC is probably not directly scalable to larger units. These data were collected from samples obtained with the PFBC operating under well-defined conditions. There is not yet sufficient information, however, to determine the effect that changing process conditions may have on the compostion/mutagenicity/cytotoxicity of the effluent stream. (ERA citation 04:054102)

1A. Aerodynamics

AD-A106 980/6 PC **A02**/MF **A01**
Office of Naval Research, London (England).
A Technical Assessment of Aeronautical Engineering in Israel.
Technical rept.,
Joseph A. Strada. 1 Jul 81, 8p Rept no. ONRL-R-5-81

A variety of Israeli academic and industrial institutions are discussed with an eye toward assessing research

and development activities in aeronautical engineering disciplines. Each institution is described in brief and some of its current research projects are listed. Research in aerodynamics, guidance and control, propulsion and combustion is discussed and industrial product lines are described where appropriate. Some conclusions are drawn in an effort to assess the country's overall capabilities in aeronautical engineering. (Author)

AD-A107 201/6 PC **A09**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Engineering.
Prediction of Aerodynamic Forces on a Circular Cylinder and a Thin Airfoil in a Transonic Airstream by the Finite Element Method.
Doctoral thesis,
James E. Marsh. 5 Jun 79, 188p AFIT/DS/AA/79M-1, AFIT-CI-79-216D

The finite element method was used to solve the nonlinear, small-disturbance, transonic, velocity-potential equation for problems of steady flow over a circular cylinder and over a thin-airfoil in a uniform steady airstream. The governing differential equation is valid for inviscid, irrotational, isenthropic flow of a perfect gas to include weak shocks providing airflow separation does not occur. For compressible subsonic and transonic flows the nonlinear small-disturbance equation was expressed in iterative form as a sequence of linear equations which was solved iteratively until the difference between two successive solutions became arbitrarily small. For analysis purposes the infinite flowfield was replaced by a finite but sufficiently large domain that was discretized with sector elements for the cylinder problem and rectangular elements for the airfoil problem. Three sub-problems were investigated for the circular cylinder. First, three different types of trial functions were investigated to approximate the solution for the velocity potential function for the case of incompressible flow without circulation. The three trial functions were: (1) a trignometric approximation resulting in a non-conforming element, (2) a bilinear polynomial (conforming element) typical of elements used in finite element analysis, and (3) a rational approximation resulting in a new conforming element. Convergence properties of each element were studied as a function of discretization refinement (element size). The second subproblem for the cylinder was to use the two conforming elements to obtain solutions for incompressible flow with circulation. Superposition was used to split the total problem into two elementary component problems.

AD-A107 318/8 PC **A05**/MF **A01**
Army Armament Research and Development Command, Aberdeen Proving Ground, MD. Ballistic Research Lab.
A Method of Determining the Turbulent Base Pressure in Uniform and Non-Uniform Supersonic Axisymmetric Flows.
Final rept.,
Thomas J. Mueller, and Lyle D. Kayser. Oct 81, 93p
Rept no. ARBRL-TR-02374

This report describes the base pressure computation procedure and computer program developed at the University of Notre Dame. The computation is valid for supersonic high Reynolds number flow at zero yaw. The computation is started upstream of the afterbody by means of the Method of Characteristics; hence, the effect of boattail, or flare, angle is determined. The effect of forebody shape can be indirectly determined if the external non-uniform Mach number profile is used as input for the start of the characteristics solution. However, the assumption of a uniform external flow generally provides good results. Examples are shown for uniform external flow inputs and for realistic non-uniform initial conditions. Also, results showing the effects of afterbody angle are presented. (Author)

AD-A107 438/4 PC **A09**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Steady/Oscillatory, Supersonic/Hypersonic Inviscid Flow Past Oscillating Wings and Wedge Combinations at Arbitrary Angles of Attack.
Master's thesis,
Evangelos Vlassios Youroukos. Jun 81, 182p

The perturbation method proposed by Professor Hui is described. The method gives exact solutions for the perturbed flow over both sides of a flat plate which is oscillating with small amplitude and frequency at large angles of attack in steady supersonic/hypersonic inviscid flow provided that the shock remains attached. Using the strip theory concepts these solutions are extended to study the dynamic stability in pitch of a flat, periodically oscillating wing arbitrary planform shape, at large angles of attack. Finally, Hui's perturbation method is extended on a stationary wedge. (Author)

N82-11033/9 PC **A05**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Wind-Tunnel Results for a Modified 17-Percent-Thick Low-Speed Airfoil Section.
R. J. Mcghee, and W. D. Beasley. Nov 81, 87p
NASA-TP-1919, L-14666

Wind-tunnel tests were conducted in the Langley low-turbulence pressure tunnel to evaluate the effects on performance of modifying a 17-percent-thick low-speed airfoil. The airfoil contour was altered to reduce the pitching-moment coefficient by increasing the forward loading and to increase the climb lift-drag ratio by decreasing the aft upper surface pressure gradient. The tests were conducted over a Mach number range from 0.07 to 0.32, a chord Reynolds number range 1.0 x 10 to the 6th power to 12.0 x 10 to the 6th power, and an angle-of-attack range from about -10 deg to 20 deg.

N82-11035/4 PC **A02**/MF **A01**
National Aerospace Lab., Tokyo (Japan).
A Study on Numerical Method for Evaluating Spanwise Integral in Subsonic Lifting-Surface Theory.
T. Ichikawa. Mar 81, 22p NAL-TR-661T, ISSN-3989-4010

Two disputable points are discussed. The first point is the coincidence of each collocation section with one of the spanwise integration points. The second point is the relatively small, but undesirable, sharp variation of the regularized influence functions near the collocation sections. Two proposals for coping with these difficulties are made. Their effects are examined by computing the downwash at the surface of a steady rectangular wing subjected to a simple wing loading. It is shown that method 1, which avoids the coincidence, makes it possible, with no losses in accuracy, to greatly reduce the computing time in cases of oscillating wings. Further, it is shown that remarkable improvement in convergence with respect to the number of spanwise integration points is obtained by method 2 which distributes the spanwise integration points densely only near the collocation sections.

N82-11037/0 PC **A03**/MF **A01**
College of Aeronautics, Cranfield (England).
A Wake Source Model for Non-Symmetric Flow past Bluff Bodies in Two-Dimensional Flow.
P. A. T. Christopher, and I. Wolton. Sep 81, 37p C-OF-A-MEMO-8109

The Parkinson and Jandali model was extended to the case where the bluff body and its wake are not symmetric with respect to the incident flow. In the case of flat plates good agreement with experiment is obtained. With a cylinder of square section agreement is good at low incidence, but at higher incidences the position of the stagnation point is less accurately predicted and there is an associated distortion of the pressure distribution.

N82-11039/6 PC **A07**/MF **A01**
North Carolina State Univ. at Raleigh. Center for Sound and Vibration.
Aircraft Wing Trailing-Edge Noise.
R. L. Underwood, and T. H. Hodgson. 1981, 145p
NASA-CR-164952
Grant NSG-1377

The mechanism and sound pressure level of the trailing-edge noise for two-dimensional turbulent boundary layer flow was examined. Experiment is compared with current theory. A NACA 0012 airfoil of 0.61 m chord and 0.46 m span was immersed in the laminar flow of a low turbulence open jet. A 2.54 cm width roughness strip was placed at 15 percent chord from the leading edge on both sides of the airfoil as a boundary layer trip so that two separate but statistically equivalent turbulent boundary layers were formed. Tests were performed with several trailing-edge geometries with the upstream velocity U sub infinity ranging from a value of 30.9 m/s up to 73.4 m/s. Properties of the boundary layer for the airfoil and pressure fluctuations in the vicinity of the trailing-edge were examined. A scattered pressure field due to the presence of the trailing-edge was observed and is suggested as a possible sound producing mechanism for the trailing-edge noise.

PB82-858531 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Vibrational Analysis in Aerodynamics. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jan 72-Dec 81.
Dec 81, 137p
Supersedes PB81-853947. Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerned with design and performance relative to aerodynamic vibration. Among the topics discussed are torsion blade flutter; vibration generated by rudders, rotor blades, panels, air foils; vortex shedding; load control; and helicopter gust response flutter. Aircraft vibrational analyses by means of analog computer simulation, autoflight control systems, and structural dynamics of aircraft are included with consideration for flight vehicle vibration control and reduction. (This updated bibliography contains 127 citations, 11 of which are new entries to the previous edition.)

PB82-858549 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Vibrational Analysis in Aerodynamics. 1970-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 97p
Supersedes PB81-853939.

Reports are cited which discuss aerodynamic aircraft and spacecraft generated vibration. Structural design flutter in air-cushion vehicles; helicopter blade flutter; steady lift wing flutter; bending-torsion flutter at supersonic, subsonic and transonic speeds; wake-induced wing flutter; stalled and unstalled flutter, and panel flutter are among the conditions discussed relative to such analysis techniques as finite element analysis. Ground vibration test results, space vehicle automated design, and calculation of critical flutter speeds for fixed-wing aircraft are included with respect to vibrational suppression performance. (This updated bibliography contains 94 citations, 16 of which are new entries to the previous edition.)

PB82-858556 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Vibrational Analysis in Aerodynamics. 1970-1981 (Citations from the NTIS Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 218p
Supersedes PB81-853921.

This bibliography cites reports on excitation and analysis techniques for flight flutter tests. Although fixed-wing aircraft, space flight vehicles, VTOL and V/STOL vehicles are included, helicopter generated vibration analysis is emphasized in this bibliography. Among the variations of flutter included are unsteady airloads, fluidelastic vibration, rotor blade in forward flight, turbomachine blades, composite wings, response of reentry vehicles, tail vibration, hingeless helicopter rotors and hinge-type, propeller whirl and SST related vibration. Analysis by aeroelastic and dynamic finite element techniques and collocation methods by computer analysis are included relative to dynamic structural damping and computer graphics in aeronautical engineering to suppress aircraft and spacecraft vibration. (This updated bibliography contains 169 citations, 33 of which are new entries to the previous edition.)

1B. Aeronautics

N82-11018/0 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
Algorithm for Fuel Conservative Horizontal Capture Trajectories.
F. Neuman, and H. Erzberger. Oct 81, 31p NASA-TM-81334, A-8746

A real time algorithm for computing constant altitude fuel-conservative approach trajectories for aircraft is described. The characteristics of the trajectory computed were chosen to approximate the extremal trajec-

tories obtained from the optimal control solution to the problem and showed a fuel difference of only 0.5 to 2 percent for the real time algorithm in favor of the extremals. The trajectories may start at any initial position, heading, and speed and end at any other final position, heading, and speed. They consist of straight lines and a series of circular arcs of varying radius to approximate constant bank-angle decelerating turns. Throttle control is maximum thrust, nominal thrust, or zero thrust. Bank-angle control is either zero or aproximately 30 deg.

1C. Aircraft

AD-A106 926/9 PC **A02**/MF **A01**
Arnold Engineering Development Center, Arnold AFS, TN.
Wind Tunnel Test of a Self-Optimizing Flexible Technology Wing.
Final rept. 4 Sep-22 Nov 79,
D. A. MacLanahan, Jr. Jan 80, 24p Rept no. AEDC-TSR-80-P3
Prepared in cooperation with ARO, Inc., Tullahoma, TN.

A 1/6-scale, semispan model of an AFTI-111 concept equipped with eleven remotely controllable hydraulic actuation systems used to control wing shape and horizontal tail angle was tested in the Propulsion Wind Tunnel (16T) at free-stream Mach numbers of 0.60 and 0.85 and free-stream dynamic pressures of 400 and 500 psf. Angle of attack was varied from 0 to 8 deg. The objectives of this test were to further develop and refine a computer-controlled self-optimizing wing for continual investigation of optimum wing airfoil contours for specific mission profiles. (Author)

AD-A106 986/3 PC **A09**/MF **A01**
Rockwell International, Thousand Oaks, CA. Science Center.
A Study of Wall Jets and Tangentially Blown Wings.
Final rept. 1 Jan 76-31 Mar 81,
N. D. Malmuth, W. D. Murphy, and J. D. Cole. Jul 81, 177p Rept no. SC5055.21FR
Contract N00014-76-C-0350
Prepared in cooperation with California Univ., Los Angeles.

A study of transonic wall jets and tangentially blown wings has been performed by using asymptotic and computational methods. For the portion of the effort dealing with wall jets, both submerged and coflowing cases have been investigated. For the submerged configurations, the nature of the decay process for disturbances emanating from the jet exit has been examined. In this analysis, the Kutta condition on the nozzle rim can be satisfied merely by requiring streamwise continuity of the potential across the rim as a trailing edge for the flow. With this model, the slip line boundaries create an exponential damped sinusoidal relaxation of the disturbances as compared to algebraic decay for analogous unconfined flows. A similar observation applies to wind tunnel far fields. The nonlinear case differs from the linear one in that the amplitude of the downstream propagated disturbance interacts nonlinearly with the near field in the former case. For these wall jets, acceleration to criticality is accomplished by stream tube contractions and throats induced by upstream influence of the turning. In the coflowing case. selection rules defining various jet flow regimes in terms of the jet transonic similarity parameter and pressure level are given. Conditions are prescribed which define the penetration length for supersonic disturbances downstream from the exit as well as the location of the throats in the jet. The critically of the flow far downstream is also quantified in terms of these parameters.

AD-A107 214/9 PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
The Air-Launched Balloon System (ALBS) Phase II Design Improvement and Test Program.
Scientific rept.,
Andrew S. Carten, Jr., and Michael R. Wuest. 1981, 14p Rept no. AFGL-TR-81-0310
Pub. in AIAA Aerodynamic Decelerator and Balloon Technology Conference (7th) , 21-23 Oct 81, San Diego, CA., Paper AIAA-81-1930.

No abstract available.

AD-A107 292/5 PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Some Unique Applications for Tethered Balloon Systems,
Catherine L. Rice, Arthur O. Korn, George H. McPhetres, and F. V. Hunsinger. 5 Nov 81, 7p Rept no. AFGL-TR-81-0297
Presented at the AIAA Aerodynamic Decelerator and Balloon Technology Conference (7th), 20-23 Oct 81, San Diego, CA., Paper AIAA 81-1916.

Properly designed tethered balloon systems are remarkably versatile test platforms. They can be erected quickly, to great heights and provide unobstructed viewing. This paper describes several systems designed and operated by the Air Force Geophysics Laboratory: a dual array to erect and recover a 1000-ft square flexible net with carbon fiber collectors; a single tether supporting sensors along its length for boundary layer measurements; a tritethered emergency substitute for a LORAN antenna; and tritethers for weapons evaluation and for tests of the Surveyor moon lander.

AD-A107 322/0 PC **A03**/MF **A01**
Foreign Technology Div., Wright-Patterson AFB, OH.
Acta Mechanica Sinica (Selected Articles),
Huang Mingke, Wang Ruquan, Liu Xue Zong, Jiao Luquohg, and Gao Zhi. 20 Oct 81, 38p Rept no. FTD-ID(RS)T-0709-81
Edited trans. of Acta Mechanica Sinica (China) n3 p217-231, 302-310 1980.

No abstract available.

AD-A107 326/1 PC **A03**/MF **A01**
Federal Aviation Administration Technical Center, Atlantic City, NJ.
First Annual Workshop on Aviation Related Electricity Hazards Associated with Atmospheric Phenomena and Aircraft Generated Inputs, February 26-27, 1980,
Joseph J. Traybar, and Nickolus O. Rasch. Oct 81, 38p Rept no. FAA-CT-81-205

This workshop was to bring together the various elements of the agency to engage in discussions to identify aviation related electricity hazards associated with both atmospheric phenomena and aircraft generated inputs, and determine a prioritize specific FAA problem area and/or requirements that need to be addressed. This information is vital in the development of the agency's posture and requirements in this important technology area. (Author)

AD-A107 355/0 PC **A09**/MF **A01**
Advisory Group for Aerospace Research and Development, Neuilly-sur-Seine (France).
AGARD Flight Test Instrumentation Series. Volume 13. Practical Aspects of Instrumentation System Installation,
Robert W. Borek. Sep 81, 199p Rept no. AGARD-AG-160-VOL-13
See also Volume 12, AD-A097 225.

This AGARDograph is the 13th of the AGARD Flight Test Instrumentation Series and outlines some of the factors that influence the development of an instrumentation system installation. The volume was not written with the intention of being a design handbook and therefore the guidelines presented are in most cases given as suggestions. The material is presented in a progressive manner starting with a review of the mission profile requirements. Included are such factors as environment, reliability and maintainability, and system safety. The assessment of the mission profile is followed by an overview of electrical and mechanical installation factors. The material presented is primarily directed at shock/vibration isolation systems and standardization of the electrical wiring installation, two factors often overlooked by instrumentation engineers. A discussion of installation hardware reviews the performance capabilities of wiring, connectors, fuses and circuit breakers, and so forth. Information is provided to guide proper selections. The discussion of the installation is primarily concerned with the electrical wire routing, shield terminations and grounding. Also included are some examples of installation mistakes that could affect system accuracy. The remaining two sections discuss system verification procedures and special considerations such as sneak circuits, pyrotechnics, aircraft antenna patterns, and lightning strikes.

N82-11013/1 PC **A04**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Effects of Vortex Flaps on the Low-Speed Aerodynamic Characteristics of an Arrow Wing.
L. P. Yip, and D. G. Murri. Nov 81, 64p NASA-TP-1914, L-14575

Tests were conducted in the Langley 12-foot low-speed wind-tunnel to determine the longitudinal and lateral-directional aerodynamic effects of plain and tabbed vortex flaps on a flat-plate, highly swept arrow-wing model. Flow-visualization studies were made using a helium-bubble technique. Static forces and moments were measured over an angle-of-attack range from 0 deg to 50deg for sideslip angles of 0 deg and + or - 4 deg.

N82-11034/7 PC **A02**/MF **A01**
National Aerospace Lab., Tokyo (Japan).
New Estimation Method for Flutter or Divergence Boundary from Random Responses at Subcritical Speeds.
Y. Matsuzaki, and Y. Ando. Apr 81, 15p NAL-TR-667T, ISSN-0389-4-10

A new technique for estimating the flutter or divergence boundary from responses due to turbulence at subcritical speeds is described. The boundary can be predicted without estimating or measuring the dampings and frequencies of the aeroelastic modes. The sampled time response is modeled by the mixed autoregressive moving average process. The orders and coefficients of both autogressive and moving average parts of the process are determined with the aid of Akaike's estimation procedure. The stability boundary is estimated by using Jury's stability determinants which are expressed in terms of the autogressive coefficients alone. The modal frequencies and dampings are also evaluated from the coefficients. The technique proposed has been applied with success to signals from a cantilever wing model tested in a low supersonic flow. Comparison between the actual and estimated flutter boundaries shows that an accurate estimation can be made from data obtained in a narrow range of the dynamic pressure which is sufficiently below the boundary.

N82-11042/0 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Low Speed Testing of the Inlets Designed for a Tamden-Fan V/STOL Nacelle.
R. C. Williams, and A. H. Ybarra. 1981, 13p NASA-TM-82728, E-1031
Presented at the V/STOL Conf., Palo Alto, Calif., 7-9 Dec. 1981.

An approximately 0.25 scale model of a tandem fan nacelle, designed for a subsonic V/STOL aircraft, was tested in a Lewis wind tunnel. Model variables included long and short aft inlet cowls and the addition of exterior strakes to the short inlet cowl. Inlet pressure recoveries and distortion were measured at pitch angles to 40 deg and at combinations of pitch and yaw to 30 deg. Airspeeds covered a range to 135 knots (69 m/sec). The short aft inlet with added strakes had the best aerodynamic performance and is considered suitable for the intended V/STOL application.

N82-11043/8 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
A Summary of V/STOL Inlet Analysis Methods.
D. P. Hwang. 1981, 12p NASA-TM-82725, E-1027
Presented at the V/STOL Conf., Palo Alto, Calif., 7-9 Dec. 1981.

Recent extensions and applications of the methods are emphasized. They include the specification of the Ku'ta condition for a slotted inlet, the calculation of suction and tangential blowing for boundary layer control, and the analysis of auxiliary inlet geometries at angles of attack. A comparison is made with experiment for the slotted inlet. An optimum diffuser velocity distribution was developed.

N82-11050/3 PC **A04**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Parametric Study of Microwave-Powered High-Altitude Airplane Platforms Designed for Linear Flight.
C. E. K. Morris, Jr. Nov 81, 74p NASA-TP-1918, L-14606

The performance of a class of remotely piloted, microwave powered, high altitude airplane platforms is studied. The first part of each cycle of the flight profile consists of climb while the vehicle is tracked and powered by a microwave beam; this is followed by gliding flight back to a minimum altitude above a microwave station and initiation of another cycle. Parametric variations were used to define the effects of changes in the characteristics of the airplane aerodynamics, the energy transmission systems, the propulsion system, and winds. Results show that wind effects limit the reduction of wing loading and the increase of lift coefficient, two effective ways to obtain longer range and endurance for each flight cycle. Calculated climb performance showed strong sensitivity to some power and propulsion parameters. A simplified method of computing gliding endurance was developed.

N82-11052/9 PC **A02**/MF **A01**
Kansas Univ./Center for Research, Inc., Lawrence.
Icing Tunnel Tests of a Composite Porous Leading Edge for Use with a Liquid Anti-Ice System.
D. L. Kohlman. Sep 81, 21p NASA-CR-164966, KU-FRL-464-3
Contract NAG3-71

The efficacy of liquid ice protection systems which distribute a glycol-water solution onto leading edge surfaces through a porous skin was demonstrated in tests conducted in the NASA Lewis icing research tunnel using a composite porous leading edge panels. The data obtained were compared with the performance of previously tested stainless steel leading edge with the same geometry. Results show: (1) anti-ice protection of a composite leading edge is possible for all the simulated conditions tested; (2) the glycol flow rates required to achieve anti-ice protection were generally much higher than those required for a stainless steel panel; (3) the low reservoir pressures of the glycol during test runs indicates that more uniform distribution of glycol, and therefore lower glycol flow rates, can probably be achieved by decreasing the porosity of the panel; and (4) significant weight savings can be achieved in fluid ice protection systems with composite porous leading edges. The resistance of composite panels to abrasion and erosion must yet be determined before they can be incorporated in production systems.

N82-11053/7 PC **E15**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Selected Bibliography of Naca-NASA Aircraft Icing Publications.
J. J. Reinmann. Aug 81, 127p NASA-TM-81651, E-668

A summary of NACA-NASA icing research from 1940 to 1962 is presented. It includes: the main results of the NACA icing program from 1940 to 1950; a selected bibliography of 132 NACA-NASA aircraft icing publications; a technical summary of each document cited in the selected bibliography; and a microfiche copy of each document cited in the selected bibliography. Document includes microfiche supplement

N82-11054/5 PC **A05**/MF **A01**
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
A Comparison of Theoretical and Experimental Pressure Distributions for Two Advanced Fighter Wings.
H. P. Haney, and R. M. Hicks. Oct 81, 87p NASA-TM-81331, A-8741

A comparison was made between experimental pressure distributions measured during testing of the Vought A-7 fighter and the theoretical predictions of four transonic potential flow codes. Isolated wind and three wing-body codes were used for comparison. All comparisons are for transonic Mach numbers and include both attached and separate flows. In general, the wing-body codes gave better agreement with the experiment than did the isolated wing code but, because of the greater complexity of the geometry, were found to be considerably more expensive and less reliable.

N82-11070/1 PC **A03**/MF **A01**
Analytical Mechanics Associates, Inc., Hampton, VA.
An Influence Coefficient Method for the Application of the Modal Technique to Wing Flutter Suppression of the Dast Arw-1 Wing.
Final Report.
S. Pines. Nov 81, 49p NASA-CR-165772, AMA-81-25
Contract NAS1-15593

The methods used to compute the mass, structural stiffness, and aerodynamic forces in the form of influence coefficient matrices as applied to a flutter analysis of the Drones for Aerodynamic and Structural Testing (DAST) Aeroelastic Research Wing. The DAST wing was chosen because wind tunnel flutter test data and zero speed vibration data of the modes and frequencies exist and are available for comparison. A derivation of the equations of motion that can be used to apply the modal method for flutter suppression is included. A comparison of the open loop flutter predictions with both wind tunnel data and other analytical methods is presented.

N82-11071/9 PC **A06**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Aeronautics and Astronautics.
Aeroacoustic Theory for Noncompact Wing-Gust Interaction.
R. Martinez, and S. E. Widnall. Oct 81, 124p FDRL-81-7
Grant NSG-2142

Three aeroacoustic models for noncompact wing-gust interaction were developed for subsonic flow. The first is that for a two dimensional (infinite span) wing passing through an oblique gust. The unsteady pressure field was obtained by the Wiener-Hopf technique; the airfoil loading and the associated acoustic field were calculated, respectively, by allowing the field point down on the airfoil surface, or by letting it go to infinity. The second model is a simple spanwise superposition of two dimensional solutions to account for three dimensional acoustic effects of wing rotation (for a helicopter blade, or some other rotating planform) and of finiteness of wing span. A three dimensional theory for a single gust was applied to calculate the acoustic signature in closed form due to blade vortex interaction in helicopters. The third model is that of a quarter infinite plate with side edge through a gust at high subsonic speed. An approximate solution for the three dimensional loading and the associated three dimensional acoustic field in closed form was obtained. The results reflected the acoustic effect of satisfying the correct loading condition at the side edge.

N82-11391/1 PC **A05**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Amplified Crossflow Disturbances in the Laminar Boundary Layer on Swept Wings with Suction.
J. R. Dagenhart. Nov 81, 90p NASA-TP-1902, L-14423

Solution charts of the Orr-Sommerfeld equation for stationary crossflow disturbances are presented for 10 typical velocity profiles on a swept laminar flow control wing. The critical crossflow Reynolds number is shown to be a function of a boundary layer shape factor. Amplification rates for crosslow disturbaces are shown to be proportional to the maximum crossflow velocity. A computer stability program called MARIA, employing the amplification rate data for the 10 crossflow velocity profiles, is constructed. This code is shown to adequately approximate more involved computer stability codes using less than two percent as much computer time while retaining the essential physical disturbance growth model.

N82-11491/9 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Integrated Analysis of Engine.
C. C. Chamis. 1981, 24p NASA-TM-82713, E-995
Presented at the Ann. Meeting of the Asme, Washington, D.C., 16-21 Nov. 1981.

The need for light, durable, fuel efficient, cost effective aircraft requires the development of engine structures which are flexible, made from advaced materials (including composites), resist higher temperatures, maintain tighter clearances and have lower maintenance costs. The formal quantification of any or several of these requires integrated computer programs (multilevel and/or interdisciplinary analysis programs interconnected) for engine structural analysis/design. Several integrated analysis computer prorams are under development at Lewis Reseach Center. These programs include: (1) COBSTRAN-Composite Blade Structural Analysis, (2) CODSTRAN-Composite Durability Structural Analysis, (3) CISTRAN-Composite Impact Structural Analysis, (4) STAEBL-StruTailoring of Engine Blades, and (5) ESMOSS-Engine Structures Modeling Software System. Three other related programs, developed under Lewis sponsorship, are described.

N82-11859/7 PC **A07**/MF **A01**
United Technologies Research Center, East Hartford, CT.
Helicopter Rotor Trailing Edge Noise.
Final Report.
R. H. Schlinker, and R. K. Amier. Nov 81, 150p NASA-CR-3470
Contract NAS1-15730

A two dimensional section of a helicopter main rotor blade was tested in an acoustic wind tunnel at close to full-scale Reynolds numbers to obtain boundary layer data and acoustic data for use in developing an acoustic scaling law and testing a first principles trailing edge noise theory. Results were extended to the rotating frame coordinate system to develop a helicopter rotor trailing edge noise prediction. Comparisons of the calculated noise levels with helicopter flyover spectra demonstrate that trailing edge noise contributes significantly to the total helicopter noise spectrum at high frequencies. This noise mechanism is expected to control the minimum rotor noise. In the case of noise radiation from a local blade segment, the acoustic directivity pattern is predicted by the first principles trailing edge noise theory. Acoustic spectra are predicted by a scaling law which includes Mach number, boundary layer thickness and observer position. Spectrum shape and sound pressure level are also predicted by the first principles theory but the analysis does not predict the Strouhal value identifying the spectrum peak.

N82-11860/5 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
SEL and EPNL Noise Duration Coefficients for the 747 and T-38 Aircraft.
W. L. Willshire, Jr. Sep 81, 12p NASA-TM-83214

Duration coefficient were calculated for Boeing 747 and T-38 airplanes for sound exposure level (SEL) and effective perceived noise level (EPNL) scales. The measured SEL suration coefficients were 8.4 for the Boeing 747 and 5.5 for the T-38 result was in good agreement with a previous result for a similar F-5 airplane. In EPNL, the duration coefficients were 7.2 for the Boeing 747 and 5.7 for the T-38. The difference in the results between the two airplanes is believed to be due to their different engine noise source spectra. The difference in the Boeing 747 results in the two different metric was due to the different frequency weighting of A-weighted sound pressure level, used in SEL, and tone-corrected perceived noise level, used in EPNL, when applied to the 747 spectra.

1D. Aircraft Flight Control and Instrumentation

AD-A106 937/6 PC **A13**/MF **A01**
Advisory Group for Aerospace Research and Development, Neuilly-sur-Seine (France).
Theory and Applications of Optimal Control in Aerospace Systems,
Pieter Kant. Jul 81, 286p Rept no. AGARD-AG-251

Modern control theory has for a long time been largely the domain of mathematicians and control theoreticians. Engineering applications were rare and partial, for a part due to the inaccessability of the theory to the practical engineer, but mainly because of the lack of computing power available to process the estimation and control algorithms resulting from the theory. In the course of the sixties and especially in the seventies the digital computer made enormous advances resulting in a reduction in size, power and cost by several magnitudes. Moreover, successful attempts were made to develop efficient algorithms which could be implemented in moderate-size onboard computers. As a result of these developments, realisation of the potential benefits of modern control has come within grasp and several applications in the aerospace field can be witnessed to-day. The present Agardograph is an attempt to present a picture of the advances in modern control as applied to aerospace system design. The Agardograph is divided into three parts. Part one deals

with some basic concepts of control theory, part two contains a number of chapters on practical design techniques developed from the theory, and finally part three describes a number of design examples and practical applications in real systems.

AD-A106 967/3 PC **A02**/MF **A01**
Royal Aircraft Establishment, Farnborough (England).
A True Air Speed Sensor for Miniature Unmanned Aircraft.
Technical memo.,
J. A. C. Beattie. Jun 81, 11p RAE-TM-SPACE-287, DRIC-BR-80019
Based on paper presented to the European Hybrid Microelectronics Conference (3rd), on 20-22 May 81, at Avignon (France).

This Memorandum describes the development of a laboratory prototype true air speed sensor for use on unmanned aircraft. The sensor works on vortex shedding principles and has a digital output. The vortices are sensed by thick film thermistor elements that are non-critical in the signal circuitry. (Author)

AD-A107 225/5 PC **A06**/MF **A01**
Boeing Commercial Airplane Co., Seattle, WA.
Aircraft Alerting Systems Standardization Study. Volume I. Candidate System Validation and Time-Critical Display Evaluation.
Final rept. Feb-Nov 80 on Phase 3,
G. P. Boucek, D. A. Po-Chedley, B. L. Berson, D. C. Hanson, and M. F. Leffler. Jan 81, 116p FAA/RD-81/38/1
Contract DOT-FA79WA-4268
See also Volume 2, AD-A106 732. Original contains color plates: All DTIC and NTIS reproduction will be in black and white. Prepared in cooperation with McDonnell Douglas and Lockheed.

This report is one of a series of documented studies directed to the improvement and standardization of aircraft alerting systems. The purpose of the study was to develop and validate, through simulation, functional design criteria that can be used in designing effective aircraft alerting systems. The major objectives of this phase study were to: resolve system component questions; validate the two candidate system concepts by comparison to a representative baseline system, for both the pilot and flight engineer stations; evaluate presentation media and display formats for time-critical warnings; develop guidelines for the design of alerting systems. The system component questions were resolved in a series of experiments and the results were integrated into two system concepts for validation. In the validation tests, line-qualified pilots exercised the three alerting systems in a full-mission, fixed-base simulator. In all areas of measurement pilot performance was as good or better with the two candidate system designs than with the conventional, baseline system. The results indicate that a flight engineer station should contain the visual display components offered by the candidate system concepts. Voice was the recommended medium of presentation when rapid response is required. The time-critical display tests showed that fastest pilot response performance was obtained when graphic guidance alerts were placed in the pilot's primary field of view. The functional design criteria that were developed are contained in 'Aircraft Alerting System Design Guidelines, ' Report Number DOT/FAA/RD-81/38/11. (Author)

AD-A107 264/4 PC **A10**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Digital Command Augmentation for Lateral-Directional Aircraft Dynamics.
Master's thesis,
David Atzhorn. May 81, 203p Rept no. AFIT-CI-81-55T

Linear-quadratic sampled-data regulator theory is used to design several Type 0 and Type 1 control laws for lateral-directional aircraft dynamics. Control structures are defined for singular command inputs and for control rate outputs; the former allows for precise following of a command whose integral appears in the state vector, while the latter uses both a difference approximation and the Tustin transform to characterize control rate in the discrete-time domain. Type 0 controllers with control rate restraint and 'equivalent' Type 1 controllers are implemented in a microprocessor-based digital flight control system, and flight tests are conducted using Princeton University's Variable-Response Research Aircraft. The control system, entitled CAS-4, offers four combinations of control: direct (unaugmented) control, Type 0 control with both roll rate/sideslip angle and roll rate/lateral acceleration command combinations, and Type 1 control with roll rate/sideslip angle command. Ground-based hybrid simulation and flight tests results show that major closed-loop response features are unaffected by the choice of sampling rate when sampled-data regulator is used. Consequently, much lower sampling rates than would normally be expected can be used when control laws are derived in this manner (a sampling rate of 10 sps is primarily used in this investigation, though lower sampling rates are investigated as well). The results derived through this investigation and presented herein provide additional evidence that digital flight control through modern control theory will be a practical way of implementing flight control systems in future high performance aircraft.

AD-A107 356/8 PC **A11**/MF **A01**
Advisory Group for Aerospace Research and Development, Neuilly-sur-Seine (France).
The Impact of New Guidance and Control Systems on Military Aircraft Cockpit Design.
Conference proceedings.
Aug 81, 227p Rept no. AGARD-CP-312
Papers presented at the Guidance and Control Panel Symposium, 5-8 May 81, Stuttgart (Germany). See also Rept. no. AGARD-CP-312-SUPPL. Text in English and French.

Partial contents: How the Helicopter Cockpit Designer Uses Digital Avionics; Electronic Flight DEck Displays for Military Transport Aircraft; Color CRT Displays for the Cockpit; Head Up Displays; Integration of Controls and Displays in US Army Helicopter Cockpits; A Standard Control Display Unit for Multi-Aircraft Application; Development of a Miniaturised Digital Thrust Demand Unit; Utilisation de la Commande Vocale a Bord des Aeronefs de Combat; Command-Response Data Transmission Applied to Mechanical Systems-Management Effect on the Crew/System Interface; The Intelligent Use of Intelligent Systems--Problems in Engineering Man/Machine Symbiosis; Vision Monoculaire et Vol Tactique sur Helicoptere; Experimental Investigation of a Helmet Mounted Sight/Display for Helicopter; Use of a Helmet-Mounted Matrix Display for Presenting Energy-Manoeuvrability Information; Evaluation of a Pilot Workload Assessment Device to Test Alternate Display Formats and Control Handling Qualities; Tanker Avionics and Aircrew Complement Evaluation; and F/A-18 Hornet Crew Station.

1E. Air Facilities

AD-A107 456/6 PC **A04**/MF **A01**
Strategic Air Command, Offutt AFB, NE. Aircraft Engineering Div.
Alert Aircraft Roll Over Chocks.
Final engineering rept.,
John M. Connolly. 14 Aug 81, 53p Rept no. SAC/LGME-ER-P-372

This is a study of the feasibility of restraining a parked alert aircraft with chocks which could be safely taxied over. Chocks were designed and then evaluated during SAC Giant Match II exercise. The chocks successfully restrained a parked aircraft and allowed a heavy weight aircraft to safely taxi over when the chocks were placed on a rough surface. Roll-over chock use was expanded command wide in 1980 for B-52G and KC-135 alert aircraft except on icy surfaces. Three ice gripping surface designs were evaluated in January 1981. All three designs performed successfully. (Author)

2. AGRICULTURE

2B. Agricultural Economics

AD-A106 828/7 PC **A06**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Corps of Engineers' Acquisition of Fish Hatchery Proves Costly.
18 Sep 81, 104p Rept no. GAO/CED-81-109

The price the Corps of Engineers paid to acquire Crystal Springs Ranch fish hatchery in Twin Falls County, Idaho, has been extremely controversial because many people in the area associated with the trout farm industry believe the price was too high. In addition, steelhead trout, which will be raised on the site, could possibly be purchased from commercial hatcheries at a substantial savings to the Government. In view of the controversy surrounding these matters, the Chairman, House Committee on Public Works and Transportation, asked us to review the procedures the Corps used to select the hatchery, the method the appraiser used to arrive at his opinion of the hatchery's fair market value, and the possibility of the Corps providing the fish more economically by contracting with commercial hatcheries. (Author)

AD-A106 841/0 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Grain Fumigation: A Multifaceted Issue Needing Coordinated Attention.
10 Sep 81, 25p Rept no. GAO/CED-81-152
Report to the Interagency Regulatory Liaison Group.

Grain fumigation is a broad subject, influencing the efficiency of grain marketing and encompassing environmental, consumer and worker protection, transportation, and food issues. Despite many years of using fumigants to eradicate insect pests from grain and grain products, and despite the involvement of many government agencies in various facets of this activity, fumigant problems remain and much still needs to be learned about fumigants and their effects. Many of the problems and questions about fumigants arise because they are toxic substances and can harm not only insects but humans as well. (Author)

AD-A107 145/5 PC **A04**/MF **A01**
General Accounting Office, Washington, DC.
Food in the Future: Proceedings of a Planning Symposium.
1981, 64p
Proceedings of a symposium held in Washington, DC on 5-6 May 81.

Contents: Making U.S. Food Policy Decisions Now and in the Future; The Goals of Consumption Policy; Food Assistance--the Changing Federal Government Role; The Global 2000 Report--Its Implications; 'Manufacturing' Food--The Relationship of Government to the Agricultural Industry Beyond the Farm Gate; Farm Productivity--Balancing Technological, Farm, and Social Goals; and Is There a Crisis in Agricultural Inputs.

AD-A107 377/4 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Information on Peanut Allotment Owners that Lease and Rent Away Rather Than Plant Their Peanut Allotments/Quotas.
21 Sep 81, 7p Rept no. GAO/CED-81-156

Section 359(b) of the Agricultural Adjustment Act of 1938, as amended, provides that anyone growing and marketing more than 1 acre of peanuts in the United States without a peanut allotment and quota is subject to a substantial penalty. Allotments have been assigned to individual farms. A person without an original allotment must either inherit, purchase, or rent the farm, or lease the peanut allotment from the farm's owner. Each allotment holder receives, as a farm poundage marketing quota, a proportionate share of the national poundage quota established by the Secretary of Agriculture. In 1981 the national peanut allotment was 1,739,000 acres. There are 16 states with allotments, but 92 percent of the allotments are in just 6 states--Alabama, Georgia. North Carolina, Oklahoma, Texas, and Virginia. When peanuts are grown under lease or rental arrangements, not by the owners of the allotments, the cost of production is increased by the lease/rent cost. According to data obtained by the Department during a 1978 survey, in 1977 this cost

ranged from a low of $31 an acre in Texas to a high of $192 an acre in Georgia.

PB82-124413 PC **A02**/MF **A01**
Statistical Reporting Service (USDA), Washington, DC.
An Evaluation of the New York Area Sampling Frame.
Staff rept.,
Jeff Geuder. Sep 81, 23p AGES-810929

A new area sampling frame was constructed for New York for use in the 1979 June Enumerative Survey. This paper presents an evaluation of the new frame. Topics examined include frame construction procedures, stratification, and sampling and nonsampling errors. In addition, the old frame is compared to the new. The new frame produced estimates approximately the same precision as the old frame for major crops.

PB82-131202 PC **A02**/MF **A01**
Agricultural Cooperative Service, Washington, DC.
Financial Profile of 15 New Agricultural Marketing Cooperatives,
Ralph W. Dutrow, Philip F. Brown, and Raymond Williams. May 81, 14p ACS/SR-2

Data obtained from the actual operations of recently formed cooperatives was the basis of this study. Fifteen new agricultural marketing cooperatives more than doubled their membership and increased their sales almost 300 percent during the period, about 1968 to 1978. These cooperatives were studied because they successfully survived their initial 5 to 10 years of operation. Banks for Cooperatives were active in providing capital for seasonal and operating purposes but less active in providing long-term loans to these new cooperatives. The original intention was to select a random sample of new cooperatives to be studied; however, because a limited number of new cooperatives are still operating all that could be identified are included in the study. These cooperatives are limited to livestock, grain, or fruit and vegetable marketing; no supply or service cooperatives are included.

PB82-131244 PC **A02**/MF **A01**
Agricultural Cooperative Service, Washington, DC.
Attitudes Toward Cooperatives by Bank Trust and Professional Farm Managers,
Michael S. Hanrahan. Dec 80, 16p ACS-SR-1

This study was conducted through interviews with bank trust departments and professional farm management companies. Farm operators of professional farm management entities (PFMEs) purchase and sell at local dealers and view farmer cooperatives as simply one type of local dealer or outlet. They make few attempts to centralize and pool either purchasing or selling transactions or to bypass local dealers, even when quantity deals are made. Purchase of insurance, however, is usually centralized.

PB82-133430 PC **A02**/MF **A01**
Statistical Reporting Service (USDA), Washington, DC.
Poultry Production, Disposition, and Income: Final Estimates for 1976-79.
Oct 81, 24p SB-677

This publication presents final estimates for production, disposition, and income from chickens, eggs, and broilers, 1976-79. This report continues the official series published in Statistical Bulletin No. 602, issued April 1978.

PB82-134123 PC **A02**/MF **A01**
Agricultural Cooperative Service, Washington, DC.
Cooperative Farm Machinery Operations: Oregon and Wisconsin,
Lloyd C. Biser. Apr 81, 13p ACS/SR-3

Oregon and Wisconsin are the two leading States in cooperative sales of heavy and full line farm machinery. A review of operations in both States provides insights into the future of cooperative activity in the machinery area. Cooperatives in Oregon increased farm machinery sales from $4.7 million in 1958 to $31.8 million in 1978. Machinery sales averaged an annual growth rate of 29 percent -- 8 percentage points more than the sales of all products sold by the same cooperatives. Cooperative farm machinery sales in Wisconsin increased from $7.4 million in 1958 to $41.6 million in 1978. This amounted to an average annual machinery growth rate of 23 percent -- 1 percentage point above the cooperatives' growth in total sales.

PB82-134388 PC **A02**/MF **A01**
Agricultural Cooperative Service, Washington, DC.
Vacation Farm Cooperatives,
Abraham Pizam, Laura Richardson, and William Seymour. Jun 81, 22p ACS/SR-5

Modern agriculture has become a complex activity requiring increased technical knowledge and large capital investments. The small farmer who cannot take advantage of the economy of scale has found it difficult to maintain an adequate standard of living or, even in some cases, to remain in farming. More farmers are seeking alternative sources of on-farm income. Increased leisure time among urban people seems to offer these farmers great potential for vacation farming. A vacation farm enterprise is like any other farming operation, with one added 'cash crop', people. The farm family takes in guests, usually city folks, for short lengths of time at moderate cost. Besides the relaxed atmosphere of a farm in the country, the guests may also enjoy swimming, hunting, fishing, hiking, or picnicking.

PB82-134552 PC **A07**/MF **A01**
Minnesota Univ., Minneapolis. Dept. of Agriculture and Applied Economics.
Risk and Allocative Errors Due to Imperfect Information: The Impact on Wheat Technology in Tunisia.
Doctoral thesis,
David Fergus Nygaard. Dec 79, 147p AID-PN-AAH-602
Contract AID/ta-BMA-5

In the 12 years since high-yield varieties of wheat were introduced in Tunisia, only 15% of all farmers have adopted them. This Ph.D. thesis explains the low adoption rate by analyzing the factors affecting a producer's input decisions (including seed choice), the judgemental errors made in output projections, and the effect of such misjudgements on wheat productivity. The author develops a theoretical model to describe this decisionmaking process. This model incorporates risk and uncertainty variables and notes the difference, or 'allocative error,' between the producer's output expectations - based on input decisions - and the actual outputs.

2C. Agricultural Engineering

AD-A106 975/6 PC **A04**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
Wastewater Treatment by a Prototype Slow Rate Land Treatment System,
Thomas F. Jenkins, and Antonio J. Palazzo. Aug 81, 54p Rept no. CRREL-81-14

Six slow rate land treatment prototypes, three containing a Windsor sandy loam and three containing Charlton silt loam, were studied from June 1974-May 1980. The systems were spray irrigated with either primary or secondary wastewater at application rates ranging from 2.5 cm/wk to 15 cm/wk. Application schedules were also varied. The performance of forage grasses was studied to determine the yield and nutrient uptake under the various application regimes. The results indicate that, on a mass basis, an average of 91% of the nitrogen (N) applied could be attributed to either plant uptake or percolation of soluble N, mainly nitrate. Nitrate concentrations in the percolate were found to correlate with N loading rate. An N loading rate of 800 kg/ha resulted in a mean concentration of about 10 mg/L of NO3-N in the percolate. Plant uptake of N was linearly related to N loading rate at loading rates less than 800 kg/ha. In this range, plant uptake accounted for about 60% of the N applied. Mean phosphorus (P) concentrations in the percolate were found to range from 0.03 to 0.07 mg/L P and depended only slightly on application rate. Removal of P averaged greater than 99% for all application regimes. Water balance measurements indicate that evapotranspiration exceeded pan evaporation by a factor ranging from 0.86 to 1.17 over a 6-year period. Treatment of biochemical oxygen demand (BODs), suspended solids, total organic carbon (TOC), and fecal coliform were excellent. Residual levels of BODs, suspended solids, and TOC in the percolate averaged 1.3, 1.2 and 1.8 mg/L, respectively.

N81-29496/9 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Bay Saint Louis, MS. Earth Resources Lab.
Evaluation of Multiband, Multitemporal, and Transformed Landsat Mss Data for Land Cover Area Estimation.
E. R. Stoner, G. A. May, and M. T. Kalcic. Apr 81, 25p E81-10161, NASA-TM-82289
Contract PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of the Interior, and Agency for International Development. Erts.

Sample segments of ground-verified land cover data collected in conjunction with the USDA/ESS June Enumerative Survey were merged with LANDSAT data and served as a focus for unsupervised spectral class development and accuracy assessment. Multitemporal data sets were created from single-date LANDSAT MSS acquisitions from a nominal scene covering an eleven-county area in north central Missouri. Classification accuracies for the four land cover types predominant in the test site showed significant improvement in going from unitemporal to multitemporal data sets. Transformed LANDSAT data sets did not significantly improve classification accuracies. Regression estimators yielded mixed results for different land covers. Misregistration of two LANDSAT data sets by as much and one half pixels did not significantly alter overall classification accuracies. Existing algorithms for scene-to scene overlay proved adequate for multitemporal data analysis as long as statistical class development and accuracy assessment were restricted to field interior pixels.

N81-29497/7 PC **A03**/MF **A01**
Lockheed Engineering and Management Services Co., Inc., Houston, TX.
An Analysis of Haze Effects on Landsat Multispectral Scanner Data.
W. R. Johnson, and M. L. Sestak. Mar 81, 40p E81-10162, NASA-CR-160984
Contracts NAS9-15800, PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of the Interior, and Agency for International Development. Erts.

Early season changes in optical depth change brightness, primarily along the soil line; and during crop development, changes in optical depth change both greenness and brightness. Thus, the existence of haze in the imagery could cause an unsuspecting analyst to interpret the spectral appearance as indicating an episodal event when, in fact, haze was present. The techniques for converting LANDSAT-3 data to simulate LANDSAT-2 data are in error. The yellowness and none such computations are affected primarily. Yellowness appears well correlated to optical depth. Experimental evidence with variable background and variable optical depth is needed, however. The variance of picture elements within a spring wheat field is related to its equivalent in optical depth changes caused by haze. This establishes the sensitivity of channel 1 (greenness) pixels to changes in haze levels. The between field picture element means and variances were determined for the spring wheat fields. This shows the variability of channel data on two specific dates, emphasizing that crop development can be influenced by many factors. The atmospheric correction program ATCOR reduces segment data from LANDSAT acquisitions to a common haze level and improves the results of analysis.

N81-29503/2 PC **A03**/MF **A01**
Elogic, Inc., Houston, TX.
New Output Improvements for Classy.
M. E. Rassbach. Mar 81, 37p E81-10189, NASA-CR-160974
Contracts NAS9-15981, PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of the Interior, and Agency for International Development. Erts.

Additional output data and formats for the CLASSY clustering algorithm were developed. Four such aids to the CLASSY user are described. These are: (1) statistical measures; (2) special map types; (3) formats for standard output; and (4) special cluster display method.

N81-29504/0 PC **A12**/MF **A01**
Environmental Research Inst. of Michigan, Ann Arbor.

Users Manual for the US Baseline Corn and Soybean Segment Classification Procedure.
Procedures Report, 15 Nov. 1979 - 14 Mar. 1981.
R. Horvath, R. Colwell, C. Hay, M. Metzler, and O. Mykolenko. Mar 81, 274p E81-10190, NASA-CR-160975
Contracts NAS9-15476, NAS9-14565
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of the Interior, and Agency for International Development Prepared in Cooperation with California Univ., Berkeley. Erts.

A user's manual for the classification component of the FY-81 U.S. Corn and Soybean Pilot Experiment in the Foreign Commodity Production Forecasting Project of AgRISTARS is presented. This experiment is one of several major experiments in AgRISTARS designed to measure and advance the remote sensing technologies for cropland inventory. The classification procedure discussed is designed to produce segment proportion estimates for corn and soybeans in the U.S. Corn Belt (Iowa, Indiana, and Illinois) using LANDSAT data. The estimates are produced by an integrated Analyst/Machine procedure. The Analyst selects acquisitions, participates in stratification, and assigns crop labels to selected samples. In concert with the Analyst, the machine digitally preprocesses LANDSAT data to remove external effects, stratifies the data into field like units and into spectrally similar groups, statistically samples the data for Analyst labeling, and combines the labeled samples into a final estimate.

N81-29505/7 PC **A02**/MF **A01**
National Oceanic and Atomospheric Administration, Houston, TX.
The Environmental Vegetation Index: A Tool Potentially Useful for Arid Land Management.
T. I. Gray, Jr., and D. G. Mccrary. Mar 81, 6p E81-10191, NASA-CR-160978
Contract PROJ. AGRISTARS
Repr. From Vol. Of Extended Abstr.: 15TH Conf. On Agr. And Forest Meteorol. And 5TH Conf. On Biometeorol., 1981 p 205-207. Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of the Interior, and Agency for International Development. Presented at the 15TH Conf. On Agr. And Forest Meteorol. And 5TH Conf. On Biometeorol., Anaheim, Calif., 1-3 Apr. 1981. Erts.

The NOAA-6 AVHRR data sets acquired over South Texas and Mexico during the spring of 1980 and after Hurricane Allen passed inland are analyzed. These data were processed to produce the Gray-McCrary Index (GMI's) for each pixel location over the selected area, which area contained rangeland and cropland, both irrigated and nonirrigated. The variations in the GMI's appear to reflect well the availability of water for vegetation. The GMI area maps are shown to delineate and to aid in defining the duration of drought; suggesting the possibility that time changes over a selected area could be useful for irrigation management.

N81-29508/1 PC **A03**/MF **A01**
Lockheed Engineering and Management Services Co., Inc., Houston, TX.
Evaluation of Spring Wheat and Barley Crop Calender Models for the 1979 Crop Year.
C. V. Nazare, and J. G. Carnes. Feb 81, 35p E81-10197, NASA-CR-160977
Contracts NAS9-15800, PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of the Interior, and Agency for International Development. Erts.

During the Large Area Crop Inventory Experiment, spring wheat planting date and crop development stage estimates based on historical normals were improved by the use of the Feyerherm planting date and Robertson spring wheat crop calendar models. The Supporting Research Crop Calendar Project element modified the Robertson model to reduce bias at cardinal growth stages within the growing season. These models were tested in 1980 along with a state-of-the-art barley model (Williams) against a ground-truth data set from 49 calendar year 1979 segments in the U.S. Great Plains spring wheat and barley region.

N81-29511/5 PC **A06**/MF **A01**
Lockheed Engineering and Management Services Co., Inc., Houston, TX.
Evaluation of Large Area Crop Estimation Techniques Using Landsat and Ground-Derived Data.
M. L. Amis, R. K. Lennington, M. V. Martin, W. G. Mcguire, and S. S. Shen. Mar 81, 136p E81-10200, NASA-CR-160998
Contract PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of the Interior, and Agency for International Development.

The results of the Domestic Crops and Land Cover Classification and Clustering study on large area crop estimation using LANDSAT and ground truth data are reported. The current crop area estimation approach of the Economics and Statistics Service of the U.S. Department of Agriculture was evaluated in terms of the factors that are likely to influence the bias and variance of the estimator. Also, alternative procedures involving replacements for the clustering algorithm, the classifier, or the regression model used in the original U.S. Department of Agriculture procedures were investigated.

PB82-137688 PC **A05**/MF **A01**
Geological Survey, Indianapolis, IN. Water Resources Div.
Effect of Irrigation Pumping on the Ground-Water System in Newton and Jasper Counties, Indiana.
Water-resources investigations (Final),
Marcel P. Bergeron. Aug 81, 82p USGS/WRD/WRI-81-096, USGS/WRI-81-38
Prepared in cooperation with Indiana State Dept. of Natural Resources, Indianapolis.

Flow in the ground-water system in Newton and Jasper Counties, Indiana, was simulated in a quasi-three-dimensional model in a study of irrigation use of ground water in the two counties. The ground-water system consists of three aquifers. Irrigation pumpage, primarily from the bedrock aquifer, was estimated to be 34.8 million gallons per day during peak irrigation in 1977. Acreage irrigated with ground water is estimated to be 6,200 acres. A series of model experiments were used to estimate the effect of increased irrigation on ground-water levels and streamflow. Model analysis indicates that major factors controlling drawdown caused by pumping in the bedrock aquifer are the variations in thickness and in vertical hydraulic conductivity in a semiconfining unit overlying the bedrock.

2D. Agronomy and Horticulture

PB82-138165 PC **A15**/MF **A01**
National Science Council of Sri Lanka, Colombo.
Bibliography of Scientific Literature on Sri Lanka and by Sri Lankan Scientists Relating to Agriculture, Forestry, Veterinary Sciences and Fisheries, 1960-1978: Volume I,
N. A. W. A. T. Alwis. 1979, 340p
See also Volume 2, PB82-138173.Portions of this document are not fully legible.

The report covers literature published in Sri Lanka on agriculture, forestry, veterinary science and fisheries during the period 1960-78. It includes 2399 entries with subject index and author index.

PB82-138173 PC **A12**/MF **A01**
National Science Council of Sri Lanka, Colombo.
Bibliography of Scientific Literature on Sri Lanka and by Sri Lankan Scientists Relating to Agriculture, Forestry, Veterinary Sciences and Fisheries, 1960-1978: Volume II,
N. A. W. A. T. Alwis. 1979, 252p
See also Volume 1, PB82-138165.Portions of this document are not fully legible.

The report covers literature published in Sri Lanka on agriculture, forestry, veterinary science and fisheries during the period 1960-78. It includes 5815 entries with subject index and author index.

PB82-139502 PC **A06**/MF **A01**
National Fertilizer Development Center, Muscle Shoals, AL.
Southeastern Soil Erosion Control and Water Quality Workshop, November 19-21, 1980, Nashville, Tennessee.
Mar 81, 116p TVA/OACD-81/10

This report includes papers presented at a workshop on soil erosion control and water quality which was held in Nashville, Tennessee, on November 19-21, 1980. Topics include: Soil erosion and water quality from the farmers viewpoint, Legislation, no tillage farming, and economics.

2F. Forestry

N81-29499/3 PC **A05**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg.
Nationwide Forestry Applications Program. Analysis of Forest Classification Accuracy.
R. G. Congalton, R. A. Mead, R. G. Oderwald, and J. Heinen. 20 Jan 81, 93p E81-10183, NASA-CR-160949
Contract PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of Interior, and Agency for International Development. Erts.

The development of LANDSAT classification accuracy assessment techniques, and of a computerized system for assessing wildlife habitat from land cover maps are considered. A literature review on accuracy assessment techniques and an explanation for the techniques development under both projects are included along with listings of the computer programs. The presentations and discussions at the National Working Conference on LANDSAT Classification Accuracy are summarized. Two symposium papers which were published on the results of this project are appended.

PB82-107293 PC **A02**/MF **A01**
Intermountain Forest and Range Experiment Station, Ogden, UT.
Monoterpenes of Lodgepole Pine Phloem as Related to Mountain Pine Beetles.
Forest Service research paper,
Walter E. Cole, E. Park Guymon, and Chester E. Jensen. Jul 81, 14p FSRP/INT-281

Phloem samples taken from 86 healthy lodgepole pine trees were analyzed for content of dry matter, starch, various forms of sugar and nitrogen, and of selected monoterpenes. Beta-phellandrene was, by far, the most prevalent of the monoterpenes. An interactive hypothesis is developed for terpene content as a function of phloem thickness, radial growth, and tree diameter. Here, high concentrations of monoterpens coincide with upper tree diameters, the expected region of high mountain pine beetle survival success.

PB82-107319 PC **A04**/MF **A01**
Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.
The Activity Fuel Appraisal Process: Instructions and Examples.
General technical rept. (Final),
Stanley N. Hirsch, David L. Radloff, Walter C. Schopfer, Marvin L. Wolfe, and Richard F. Yancik. Mar 81, 52p FSGTR-RM-83

The quantitative process for appraising fire hazard from activity fuels combines fire- and fuel-modeling with decision analysis principles to produce an estimate of expected burned area. Expected fire occurrence, climate, fuel loads, fire behavior, and suppression capability are considered in the fuel appraisal process. Two case study examples are presented.

PB82-107509 PC **A10**/MF **A01**
Forest Policy Project, Vancouver, WA.
Forest Policy Project Module III-A: Timber Supply Analysis and Baseline Simulations.
Final rept.,
C. M. Rahm. 31 Mar 81, 225p
Contract PNRC-10890602
See also report dated Jan 81, PB81-219909. Prepared by Boeing Computer Services Co., Seattle, WA.

The report presents a timber supply projection for the Pacific Northwest Region (Oregon, Washington and Idaho). Key features of this projection are: Present policies were assumed to prevail; A timber supply model was employed which incorporates a regional demand curve for timber; An up-to-date timber inventory was prepared; Information was collected on timber management and harvest methods including costs of removing the timber, regenerating the acres harvested and managing subsequent regrowth.

PB82-108085 PC **A15**/MF **A01**
Forest Policy Project, Vancouver, WA.
Forest Policy Project Module IV A: Socioeconomic Impact Assessment and Module IV B: Environmental Impact Assessment.
Final rept.
31 Mar 81, 350p

PNRC-10890602
Prepared by Centaur Associates, Inc., Washington, DC., and Montgomery (James M.), Inc., Pasadena, CA. See also report dated Jan 81, PB81-219909.

This report analyzes potential economic and environmental impacts of activities on forest land in the Pacific Northwest. Employment and income are projected under an assumption of present policies and techniques are described for estimating the impacts on these projections of alternative forest policies. Environmental impacts resulting from timber processing, timber management and harvesting, and from selected nontimber activities are described.

PB82-109125 PC **A18**/MF **A01**
Forest Policy Project, Vancouver, WA.
Alternative Forest Policies for the Pacific Northwest: Study Module V.
Final rept.,
William E. Bruner, and Perry R. Hagenstein. Jun 81, 410p
PNRC-10890602

This report analyzes several forest policy issues facing the Pacific Northwest and, using an economic simulation model, tests the possible impacts of policy changes. Issues treated include: transportation rates for timber products, log exports, wilderness designation, public land management, loss of private forest land and nontimber uses of forest land. Impacts are evaluated in terms of timber harvest and prices, recreation use and values, output of timber products, employment and incomes.

PB82-133422 PC **A03**/MF **A01**
Southeastern Forest Experiment Station, Asheville, NC.
Biomass in Southeastern Forests.
Forest Service research paper,
Joe P. McClure, Joseph R. Saucier, and R. C. Biesterfeldt. Sep 81, 41p SEFES-81-26

The 88.5 million acres of commercial forest land in the Southeast contain some 6.2 million green tons of woody biomass. Distribution of this material is reported by State, tree size, and tree species. Relative amounts in various portions of typical trees are also reported for major species groups.

PB82-134271 PC **A05**/MF **A01**
Georgia Inst. of Tech., Atlanta.
A Wooden Energy Demonstration Center in Alabama. Phase I: A Background Investigation.
Final rept.,
Tze I. Chiang, Edwin A. Bethea, and Meredith Richardson. Mar 80, 97p
Sponsored in part by Department of Commerce, Washington, DC.

The main objective of the report was to gather background data needed for organizing the wood energy demonstration center. Four main areas which have been investigated are: timber resources, woodworking industries, wood residues, and potential uses of wood energy generated. The study area is a 50-mile radius of Troy, Alabama.

PB82-134438 PC **A02**/MF **A01**
Pacific Southwest Forest and Range Experiment Station, Berkeley, CA.
New Record of Introduced Hosts for the Mountain Pine Beetle in California.
Forest Service research note (Final),
Richard H. Smith, John P. Cramer, and Edwin J. Carpenter. Sep 81, 6p FSRN-PSW-354

In a pine arboretum near Placerville, in northern California, 27 pine species, varieties, or hybrids--many of them introduced species--were attacked by the mountain pine beetle (Dendroctonus ponderosae). Among these 27 species, 7 were reported previously as either native or introduced hosts. These results provide a basis for review and possible revision of the taxonomy of the mountain pine beetle.

PB82-134446 PC **A02**/MF **A01**
Pacific Southwest Forest and Range Experiment Station, Berkeley, CA.
Preserving the Green Sale Value of Dying Ponderosa Pine with Lindane.
Forest Service research note (Final),
Richard H. Smith. May 81, 5p FSRN-PSW-350

Pines with dead or dying crowns but without insects or stain in the lower trunk were sprayed in early spring with 1 percent lindane emulsion. The pheromone triplet of the western pine beetle was used to attract the beetle to some of the treated and untreated trees. By late fall 93 percent of the sprayed trees, but only 7 percent of the unsprayed trees, were still without insect attack or wood stain.

PB82-134453 PC **A02**/MF **A01**
Pacific Southwest Forest and Range Experiment Station, Berkeley, CA.
Oak Management in California.
General technical rept. (Final),
Timothy R. Plumb. Jul 81, 19p FSGTR-PSW-54

Native oak species grow on 15 to 20 million acres of California land, and have an estimated net volume of about 3 billion cu ft. This resource, valuable for not only traditional wood products, but also for wildlife habitat, watershed protection, and recreational-esthetic values, is not effectively managed, partly because of a lack of silvicultural and other management knowledge. Viable acorns of scrub oak can be picked 1-1/2 to 2 months before normal maturity, and after proper drying, can be stored for at least 1 year at 3 to 4C.

PB82-134479 PC **A02**/MF **A01**
Pacific Southwest Forest and Range Experiment Station, Berkeley, CA.
Field Evaluation of Phloem-Mobile Acephate for Suppression of Southern Pine Beetle.
Forest Service research note (Final),
Carl E. Crisp, Gerard D. Hertel, Paul E. Buffam, and Carroll B. Williams, Jr. May 81, 5p FSRN-PSW-352

Using aerially-applied acephate (Orthene 75S), a phloem-mobile insecticide, to protect loblolly pine (Pinus taeda) against attack by southern pine beetle (Dendroctonus frontalis) does not show promise. In a field experiment near Jacksonville, North Carolina, in 1975, basipetal transport of acephate was assessed. Analyses of residues and gallery length reduction showed that this insecticide did not translocate from the foliage to the phloem of the bole when the trees were sprayed in October at the rates of 1.1 and 2.3 kg. a.i./1851/ha.

3. ASTRONOMY AND ASTROPHYSICS

3B. Astrophysics

AD-A107 126/5 PC **A02**/MF **A01**
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
Voyager Observations of Jupiter's Distant Magnetotail.
Progress rept.,
W. S. Kurth, D. A. Gurnett, F. L. Scarf, R. L. Poynter, and J. D. Sullivan. 17 Sep 80, 13p
Contract N00014-76-C-0016
Pub. in Jnl. of Geophysical Research, v86 nA10 p8402-8412, 30 Sep 81.

No abstract available.

AD-A107 127/3 PC **A02**/MF **A01**
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
Determination of Jupiter's Electron Density Profile from Plasma Wave Observations.
Progress rept.,
D. A. Gurnett, F. L. Scarf, W. S. Kurth, R. R. Shaw, and R. L. Poynter. 12 Jun 80, 16p
Contract N00014-76-C-0016
Pub. in Jnl. of Geophysical Research, v86 nA10 p8199-8212 1981.

No abstract available.

AD-A107 217/2 PC **A02**/MF **A01**
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
Parametric Interaction and Spatial Collapse of Beam-Driven Langmuir Waves in the Solar Wind.
Progress rept.,
D. A. Gurnett, J. E. Maggs, D. L. Gallagher, W. S. Kurth, and F. L. Scarf. 19 Feb 80, 11p
Contract N00014-76-C-0016, Grant NSF-ATM78-19958
Pub. in Jnl. of Geophysical Research, v86 nA10 p8833-8841, 30 Sep 81. Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

No abstract available.

DE81030835 PC **A02**/MF **A01**
Lick Observatory, Mount Hamilton, CA.
Thermonuclear Model for gamma -Ray Bursts.
S. E. Woosley. 26 Aug 81, 23p UCRL-86611, CONF-810871-2
Contract W-7405-ENG-48
Workshop on gamma ray transients and related astrophysical phenomena, La Jolla, CA, USA, 5 Aug 1981.

The evolution of magnetized neutron stars with field strengths of approx. 10 exp 12 gauss that are accreting mass onto kilometer-sized polar regions at a rate of approx. exp 13 M sub 0 yr exp -1 is examined. Based on the results of one-dimensional calculations, one finds that stable hydrogen burning, mediated by the hot CNO-cycle, will lead to a critical helium mass in the range 10 exp 20 to 10 exp 22 g km exp -2 . Owing to the extreme degeneracy of the electron gas providing pressure support, helium burning occurs as a violent thermonuclear runaway which may propagate either as a convective deflagration (Type I burst) or as a detonation wave (Type II burst). Complete combustion of helium into exp 56 Ni releases from 10 exp 38 to 10 exp 40 erg km exp -2 and pushes hot plasma with beta $>$ 1 above the surface of the neutron star. Rapid expansion of the plasma channels a substantial fraction of the explosion energy into magnetic field stress. Spectral properties are expected to be complex with emission from both thermal and non-thermal processes. The hard gamma -outburst of several seconds softens as the event proceeds and is followed by a period, typically of several minutes duration, of softer x-ray emission as the subsurface ashes of the thermonuclear explosion cool. In this model, most gamma -ray bursts currently being observed are located at a distance of several hundred parsecs and should recur on a timescale of months to centuries with convective deflagrations (Type I bursts) being the more common variety. An explanation for Jacobson-like transients is also offered. (ERA citation 06:035535)

N82-12004/9 PC **A02**/MF **A01**
Smithsonian Astrophysical Observatory, Cambridge, MA.
Theoretical Studies of Chromospheres and Winds in Cool Stars.
Semiannual Report, 1 Apr. - 30 Sep. 1981.
A. K. Dupree. Nov 81, 8p NASA-CR-164969, SAR-2
Contract NAGW-100

Calculated radiative losses from H, H-, Ca II, and Mg II show that cooling for the chromosphere of the supergiant epsilon Gem do not differ greatly from the solar law, although there are differences at approximately 6000K due to ionization effects. With a rough standard law for computation of stellar winds using the Hartmann-MacGregor theory and standard stellar evolutionary calculations, the wind velocities and temperatures in the HR diagram were systematically explored. Results show that cool winds with tempratures 1,000,00K are not possible for log g or = 2. Predicted wind velocities are approximately 1.5 to 2 x larger than observed, particularly for the most luminous cool stars. The ionization balance for the wind of alpha ORI and the hydrogen profile lines for T Tauri stars were computed using the PANDORA computer program.

N82-12010/6 PC **A05**/MF **A01**
District of Columbia Univ., Washington.
Computation of Averaged Monthly Zonal Albedo Utilizing the Solar Zenith Angle, Properties of Clear and Cloudy Atmospheres.
H. Dhuria. Aug 81, 93p NASA-CR-164930
Contract NAG5-75

The zonal temporal averages of albedos at the top of the atmosphere were considered as a function of the length of the day. The length of the day were used to

determine the average daily values of mu sub 0(=Cos of the solar zenith angle, theta sub 0). Polynominal fits of the slope and intercept functions of A sub s (cloud-free albedo) and A sub c(cloud albedo) as function of Cos theta sub 0 were obtained by using the sample values of albedo corresponding to solar zenith angles from 0 to 90 deg with interval of 5 deg. The daily zonal values of mu sub 0 and the surface albedos were used to compute the daily zonal values of albedos at the top of the clear and cloudy atmosphere. The monthly zonal cloud fractions were used to compute planetary albedo A at the top of the atmosphere. The global values of monthly albedos A sub s, A sub c and A were computed by using the weighting function defined as the difference of the signs of zonal values of latitudes. The computer program implementation is also described.

N82-12015/5 PC **A02**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Radiative Transfer in Cometary Dust Atmospheres: Critique of Recent Developments.
O. Vonroos. 1 Oct 81, 20p NASA-CR-164946, JPL-PUB-81-80
Contract NAS7-100

The gas and dust production rates of comets near the sun are intimately linked to the fate of the solar radiation as it is scattered and partially absorbed by the cometary dust envelope or halo surrounding the comet's nucleus. The radiation of nuclear matter (mostly water ice) and the release of dust particles embedded in the ice which are entrained by the escaping gas and subsequently form a dust atmosphere or halo. On the other hand, the interaction of the dust cloud with the solar radiation is in turn responsible for the amount of radiative energy received by the nucleus and thus determines the evaporation rate. It is shown that recent attempts to formulate this problem quantitatively are in error. The correct formulation is given and it is pointed out that negative extinction (enhancement of the primary radiation received by the nucleus due to multiple scattering) may not be as large as predicted.

N82-12020/5 PC **A03**/MF **A01**
California Univ., Berkeley.
A Review and Interpretation of Recent Cosmic Ray Beryllium Isotope Measurements.
A. Buffington. 26 Apr 78, 28p NASA-CR-164967
Contracts NGR-05-003-553, W-7405-ENG-48
Submitted for Publication. Presented at a Symp., Washington, D.C., 26 Apr. 1978; Sponsored by the AM. Phys. Soc.

Beryllium-10 is of interest for cosmic ray propagation, because its radioactive decay half-life is well matched to the expected cosmic ray age. Recent beryllium isotope measurements from satellites and balloon covered an energy range from about 30 to 300 MeV/nucleon. At the lowest energies, most of the Be-10 is absent, indicating a cosmic ray lifetime of order 2 x 10 to the 7th power years and the rather low average density of 0.2 atoms/cc traversed by the cosmic rays. At higher energies, a greater propagation of Be-10 is observed, indicating a somewhat shorter lifetime. These experiments will be reviewed and then compared with a new experiment covering from 100 to 1000 MeV/nucleon. Although improved experiments will be necessary to realize the full potential of cosmic ray beryllium isotope measurements, these first results are already disclosing interesting and unexpected facts about cosmic ray acceleration and propagation.

PB82-130774 PC **A06**/MF **A01**
World Data Center A for Solar-Terrestrial Physics, Boulder, CO.
Evolutionary Charts of Solar Activity (Calcium Plages) as Functions of Heliographic Longitude and Time 1964-1979,
E. Ruth Hedeman, Helen W. Dodson, and Edmond C. Roelof. Aug 81, 116p UAG-81, NOAA-81100601
Prepared in cooperation with Johns Hopkins Univ., Laurel MD. Applied Physics Lab.Color illustrations reproduced in black and white.

Evolutionary charts have been prepared at the Applied Physics Laboratory of the Johns Hopkins University on the basis of McMath-Hulbert Observatory data and diagrams, (with the exception of the last three months of 1979, for which plage data from the Hale Observatories and reported in the Solar-Geophysical Data Bulletins have been used). These charts organize data relating to practically all calcium plages reported by the McMath-Hulbert Observatory to World Data Center A for Solar-Terrestrial Physics (Boulder) in the years 1964-1979. The survey covers centers of activity for all of Cycle 20 and the rise to maximum of Cycle 21. More than 200 solar rotations are represented in the charts. In Section II (Table 1) an extensive compilation of data is presented on the principal centers of activity, 1964-1979. The remarks summarize significant solar characteristics as well as terrestrial effects such as geomagnetic storms and energetic particle events. In addition, a quantitative Active Region Index (ARI) and a more detailed Active Region Profile is computed from five solar indicators of the regions' disc transit activity.

PB82-133869 Not available NTIS
National Bureau of Standards, Washington, DC.
Relations among Stellar X-ray Emission Observed from Einstein, Stellar Rotation and Bolometric Luminosity.
Final rept.,
R. Pallavicini, L. Golub, R. Rosner, G. S. Vaiana, and T. Ayres. 1981, 12p
Grant NGL-06-003-057
Pub. in Astrophysical Jnl. 248, p279-290, 15 Aug 81.

The authors have determined the correlation between observed stellar X-ray luminosities, bolometric luminosities, and projected rotational velocities v sin i for stars of various spectral types and luminosity classes observed by the Einstein Observatory. Results are discussed.

PB82-133885 Not available NTIS
National Bureau of Standards, Washington, DC.
Density Sensitive C II Lines in Cool Stars of Low Gravity.
Final rept.,
R. E. Stencel, J. L. Linsky, A. Brown, C. Jordan, and K. G. Carpenter. 1981, 7p
Contract NAS5-23274
Pub. in Monthly Notices of the Royal Astronomical Society Short Commun. 196, p47-53 1981.

It is shown that the relative intensities of emission lines within the multiplet uv 0.01 of C II, around 2325 A, are sensitive to electron density in the range 10 to the 9th power > N(e) > 10 to the 7th power/cc. The lines therefore offer a valuable method for measuring N(e) in the chromospheres of late-type giants and supergiants. Calculated line ratios are compared with those observed in a range of objects.

PB82-133927 Not available NTIS
National Bureau of Standards, Washington, DC.
The Tides of Io.
Final rept.,
C. F. Yoder, and S. J. Peale. 1981, 35p
Pub. in Icarus 47, p1-35 1981.

The Galilean satellites Io, Europa and Ganymede interact through several stable orbital resonances. A theory of origin and subsequent evolution of these resonances outlined earlier (Yoder, 1979) is described in detail.

PB82-859190 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Black Hole Mathematics. 1970-1981 (Citations from the Searchable Physics Information Notices Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 104p
Supersedes PB81-857724.

Citations in this bibliography cover equations of state, equations of motion, and other specialized equations relative to the formation and evolution of black holes in the cosmos. Black hole physics is mathematically delineated, and cosmological interpretations and implications of black holes are considered. (This updated bibliography contains 94 citations, 39 of which are new entries to the previous edition.)

3C. Celestial Mechanics

PB82-859596 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Earth Rotation. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for Jan 75-Dec 81.
Dec 81, 289p

This bibliography covers observations, measurements, analyses, and interpretations of solid earth rotation phenomena. Consideration is given to variations in rotation rate and attitude. Attention is also paid to relationships between rotation and earth structure and deformation. Atmospheric and hydrospheric effects of earth rotation are excluded. (Contains 296 citations fully indexed and including a title list.)

4.
ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-A106 925/1 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
The Debate over Acid Precipitation--Opposing Views--Status of Research.
11 Sep 81, 54p Rept no. GAO/EMD-81-131

The use of coal as a substitute for imported oil is raising concern over the possible impact of acid precipitation on the environment and human health. Precipitation can become acidified when sulfur and nitrogen oxides emitted by fossil-fueled powerplants, vehicles, and other man-made or natural sources are chemically changed in the atmosphere and return to earth as acid compounds. Environmental organizations and some agencies and interest groups contend that more stringent emission controls are needed immediately. On the other hand, some agencies and many industries, particularly in the coal and utility sectors, argue that much more research is needed to determine if achievable emissions reductions could significantly diminish the extent of acid precipitation, and if the benefits of such regulations would be worth their potentially high cost.

AD-A107 032/5 PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
An Aerosol Data Base Format.
Memorandum rept.,
Gary L. Trusty, and Kenneth M. Haught. 24 Sep 81, 17p Rept no. NRL-MR-4605

We describe a data base format which allows easy comparisons of results from a large collection of aerosol measurements from several locations. (Author)

AD-A107 117/4 PC **A03**/MF **A01**
SRI International, Menlo Park, CA.
Chatanika Radar Measurements during the Auroral E Program.
Scientific rept. no. 1,
Robert M. Robinson, and Richard R. Vondrak. Jun 81, 48p AFGL-TR-81-0238
Contract F19628-81-K-0037

Chatanika radar electron-density and electric-field measurements were made during the Auroral E rocket program. Four instrumented sounding rockets were launched into the diffuse aurora from Poker Flat Research Range near Fairbanks, Alaska. The radar provided ionospheric data during eight consecutive nights preceding the launch. The radar data from the night of the launch were analyzed to determine the extent and duration of the auroral E layer. The electron density data indicated that the southward advance of the diffuse aurora was consistent with the average shape of the statistical auroral oval. During the rocket launches the E layer was uniform with a maximum density of about 200,000 to 300,000 el/cu. cm at an altitude of

125 km. The energy flux of precipitating electrons was 1.5 to 2.0 ergs/sq. cm-sec. The mean energy of the electrons was inferred to be about 2 keV. Electric fields were northward with a magnitude of 30 mV/m. No auroral arcs were present within the range of the rocket trajectories.

AD-A107 262/8 PC **A08**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
A Computational Study of the Modification of Raindrop Size Distributions in Subcloud Downdrafts.
Doctoral thesis,
Robert George Borchers. Aug 81, 161p Rept no. AFIT-CI-81-44D

A computational study is made of the variation of steady-state raindrop-size distributions (0.004 cm less than or equal to radius less than or equal to 0.40 cm) in adiabatic subcloud downdrafts of constant magnitude. The cloud base drop-size distribution is assumed to be Marshall-Palmer. The microphysical processes progressively introduced are evaporation, collision-coalescence, aerodynamic and collisional breakup of drops. Collision-coalescence and breakup area treated through a stochastic model. Thermodynamic and hydrometeoric variables of temperature, relative humidity, total liquid water, rainfall rate and radar reflectivity are computed as functions of height below cloud base along with the drop-size distributions. It is found that evaporation tends to deplete, as expected, the smaller members of the droplet population. Computed raindrop-size distributions agree quite well with measured maritime raindrop spectra reported in the literature, the agreement being better for the higher precipitation rates measured. Other results of the study, as anticipated, are (1) that the downdraft remains unsaturated in the presence of precipitation, the degree of subsaturation increasing with the strength of the downdraft, and (2) that the temperature in the downdraft lies between the moist-adiabatic and the dry-adiabatic lapse rates of temperature.

AD-A107 263/6 PC **A07**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Determination of Ice Crystal Growth Parameters in a Supercooled Cloud Tunnel.
Master's thesis,
Mike Wayne Kowa. Jun 81, 146p Rept no. AFIT-CI-81-36T

In order to completely understand the behavior of a dynamically changing ice crystal as it falls through a supercooled cloud, the simultaneous determination of the crystal size, mass, apparent density, and fall velocity is desirable. Based on the experience obtained in our two previous ice crystal growth studies, a new supercooled cloud tunnel has been developed. It has successfully demonstrated the capability of accurately simulating the crystal growth under free-fall conditions in a natural supercooled cloud. The new vertically converging design for the working/observation section of the tunnel permits ice crystals to be stably suspended in a supercooled cloud airstream for indefinite lengths of time. A new fog chamber is used to make the supercooled fog homogeneous with respect to droplet number and concentration, and temperature, before entering the working/observation section. A method has been developed by which the moisture content in the supercooled fog can be controlled and held constant. The flow rate through the working/observation section is controlled by a specially designed valve which also maintains the total flow into the chamber at a constant level. This configuration keeps the supercooled fog condition constant throughout an experimental run. A special method is devised to preserve the collected ice crystals so they can be photographed from both the top and side. This method also allows for accurate crystal mass determination by melting. The flow velocity, and therefore crystal fall velocity, is continually measured by an electronic manometer while a thermocouple continually records the supercooled fog temperature.

AD-A107 269/3 PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
The Lower-Hybrid-Drift Instability in Non-Antiparallel Reversed Field Plasmas.
Memorandum rept.,
J. D. Huba, N. T. Gladd, and J. F. Drake. 29 Oct 81, 31p Rept no. NRL-MR-4612

The lower-hybrid-drift instability is investigated in non-antiparallel reversed field plasmas, i.e., the magnetic fields on either side of a neutral line are not anti-parallel. Such a magnetic field configuration contains magnetic shear which has a stabilizing influence on the lower-hybrid-drift instability. It is found that magnetic shear has an inhibiting effect on the linear penetration of the lower-hybrid-drift mode toward the neutral line. The implications of this result to the reconnection processes in the magnetosphere (i.e., the nose and the magnetotail) are discussed. (Author)

AD-A107 270/1 PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
Field Experiments with Artificial Aerosols at San Nicolas Island, California.
Memorandum rept.,
S. G. Gathman, B. G. Julian, L. A. Mathews, and R. M. McClung. 28 Oct 81, 43p Rept no. NRL-MR-4638

Artificial fogs grown on hygroscopic (Salty Dog) nuclei were produced in the marine environment over Laser Bay, San Nicolas Island, California. These fogs were studied using over water optical extinction measurements in the visual, near and far infrared bands as well as by aerosol size measurements from an instrumented aircraft and from a shore based instrument. These studies show that optical extinction in the visible and near infra red wavelengths produced by biologically safe hygroscopic nuclei can be generated in military significant scales in the marine boundary layer. (Author)

AD-A107 289/1 PC **A04**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Efficient Radiative Transfer Computations in the Atmosphere.
Master's thesis,
Charles Robert Posey, II. Jan 81, 51p Rept no. AFIT-CI-81-37T

An efficient longwave radiation transfer band model was developed and applied to the MIT Stratospheric General Circulation Model (GCM). The band model is a revised version of models by Ramanathan (1976) and by Alimandi and Viscounti (1979). It is validated by comparison with work by Dopplick (1971), Slade (1969) and by Park and London (1974). The band model produced pole-to-pole heating gradients up to 9 deg K/day compared with Newtonian heating gradients of 1-2 deg K/day used previously in the GCM. In 5 day-model integrations, the band model sharpened erroneous temperature gradients in the GCM when compared with the Newtonian heating scheme. Poleward eddy heat fluxes appear to be too weak in the low-resolution, 6 wave spectral GCM to balance the heating gradients of the band model. An 18-wave spectral GCM is planned by the MIT stratospheric working group. With the band model, global heating rates up to 3 deg K/day are noted. Such global heating rates cannot be sustained in the atmosphere. Methods to achieve global heating balance are explored. The most straight forward method is to set the Horizontal-averaged temperatures of the GCM equal to the radiative equilibrium temperatures of the band model. (Author)

AD-A107 308/9 PC **A02**/MF **A01**
Calspan Advanced Technology Center, Buffalo, NY.
Aerosol Composition in the Marine and Coastal Boundary Layer.
Technical paper,
E. J. Mack, J. T. Hanley, R. J. Pilie, C. K. Akers, and B. J. Wattle. Aug 81, 11p
Contract N00014-81-C-0519
Presented at the Annual SPIE Technical Symposium (25th), v305 n20 held on 24-28 Aug 81 at San Diego, CA.

This paper focuses on aerosol composition data obtained in the North Atlantic, in the Mediterranean, in the northern Gulf of Mexico, off the coasts of California, Nova Scotia and Portugal, and on shore on Cape Cod and on the North Sea Coast of West Germany. The data show that the marine aerosol population varies considerably in composition, particularly in coastal areas, and does not necessarily comprise primarily sea salt aerosols. As a result of these compositional differences, response of the aerosol to fluctuations in relative humidity is expected to differ from one locale or airmass to another. Therefore, aerosol size spectra alone are not sufficient for the prediction of visibility or the potential performance of EO systems under changing humidity conditions. (Author)

AD-A107 330/3 PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Measurements of Structural Features in Profiles of Mesospheric Density,
C. R. Philbrick. 1980, 10p Rept no. AFGL-TR-81-0296
Pub. in Middle Atmosphere Program, Handbook for Map, v2 p333-340.

No abstract available.

AD-A107 361/8 PC **A02**/MF **A01**
Pennsylvania State Univ., University Park. Ionosphere Research Lab.
Ionization and Aerosol Particulates in the Middle Atmosphere.
Final rept. 10 Jun 78-9 Dec 80,
Leslie C. Hale. Oct 81, 18p PSU-IRL-FR-81/1, ARO-15733.1-GS
Grant DAAG29-78-G-0129

The research performed during the course of this Grant included both analysis of previously obtained data and additional experimental work. The principal experimental work involved the preparation and launching of rocket payloads during two solar eclipse expeditions: to Northern Ontario in February, 1979 and to Kenya in February, 1980. These payloads used blunt conductivity probes to measure atmospheric conductivity, and the changes in conductivity produced by lamps built into the payloads, both visible and ultraviolet. (Author)

AD-A107 403/8 MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Empirical F-Region Model Development Based on S3-1 Satellite Measurements,
C. R. Philbrick. 19 Oct 81, 9p Rept no. AFGL-TR-81-0298
Pub. in Proceedings of Symposium on the Effect of the Ionosphere on Radiowave Systems (1981), 14-16 Apr 81, p711-717.
Availability: Microfiche copies only.

No abstract available.

AD-A107 512/6 PC **A06**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Meteorological Factors in High Resolution Satellite Imagery (DMSP).
Master's thesis,
Mark Evans Schultz. Jun 81, 107p

Comparisons of the predicted aerosol size distributions from the Shettle and Fenn, the Munn-Katz, and the Hybrid models are made with aerosol size distribution data sets collected off the California coast near Monterey in April and May, 1980. It is shown that the mixing volume (inversion height) is an important parameter in predictive aerosol distribution equations. The Hybrid model is determined to be inaccurate when compared with the Shettle and Fenn and the Munn-Katz models. The Shettle and Fenn model consistently provided the most accurate results. However, it requires an input of either total particle concentration or visibility, neither of which are easily measured or predicted. The Munn-Katz model is determined to be the most operationally useful of the three models studied. It depends only on the bulk meteorological parameters of wind speed, relative humidity and altitude. The Munn-Katz model neglects mixing volume and advection. The observed data further suggest than an aerosol model which does not include a continental distribution may be more appropriate for the open ocean environment.

DE82000071 PC **A09**/MF **A01**
Automation Industries, Inc., Silver Spring, MD. Vitro Labs. Div.
August 1981 Environmental Data for Sites in the National Solar Data Network.
Aug 81, 176p SOLAR/0010-81/08
Contract AC01-79CS30027

Environmental information collected at the sites of the National Solar Data Network is tabulated for each solar site. The sites are grouped into 12 zones, each of which consists of several adjacent states. The insolation table presents the total, diffuse, direct, maximum, and extraterrestrial radiation for the site. It also shows the ratio of total to extraterrestrial radiation. The temperature table gives the average, daytime, nighttime, maximum, minimum, and inlet-water temperature for the site. All of the passive and some active solar sites are equipped with wind sensors which provide information on wind speed and direction. For some sites, a

humidity table provides relative humidity values for day and night. It also gives values for the maximum and minimum humidity for each day. A technical discussion of the instruments and measurements used to obtain the data is included. (ERA citation 06:034490)

EUR-7011-EN PC **A13**/MF **A01**
Commission of the European Communities, Brussels (Belgium). Directorate General for Research, Science and Education.
Solar Energy R + D Programme, 1979-1983. Project F: Solar Radiation Data.
1981, 283p CONF-8005166-
Coordination meeting of contractors, Julich, F.R. Germany, 5 May 1980.
U.S. Sales Only.

Individual presentations report work in the following areas: production of test reference years for model simulation of solar systems and components; global radiation atlas for horizontal surfaces; radiation data on inclined surfaces; intensity thresholds and cumulative frequency curves; useful energy output from solar collectors; network comparison of pyranometers; measurements of turbidity, spectral radiation, etc.; satellite data. (ERA citation 06:023263)

N82-11512/2 PC **A04**/MF **A01**
Research and Data Systems, Inc., Lanham, MD.
SMMR Data Set Development for GARP.
J. Kogut. May 81, 60p NASA-CR-166721
Contract NAS5-25781

The NIMBUS 7 Scanning Multichannel Microwave Radiometer (SMMR) data are analyzed. The impact of cross polarization and Faraday rotation on SMMR derived brightness temperatures is evaluated. The algorithms used to retrieve the geophysical parameters are tested, refined, and compared with values derived by other techniques. The technical approach taken is described and the results presented.

N82-11688/0 PC **A08**/MF **A01**
SRI International, Menlo Park, CA.
Improved Simulation of Aerosol, Cloud, and Density Measurements by Shuttle Lidar.
Final Report.
P. B. Russell, B. M. Morley, J. M. Livingston, G. W. Grams, and E. W. Patterson. Nov 81, 165p NASA-CR-3473
Contract NAS1-16052

Data retrievals are simulated for a Nd:YAG lidar suitable for early flight on the space shuttle. Maximum assumed vertical and horizontal resolutions are 0.1 and 100 km, respectively, in the boundary layer, increasing to 2 and 2000 km in the mesosphere. Aerosol and cloud retrievals are simulated using 1.06 and 0.53 microns wavelengths independently. Error sources include signal measurement, conventional density information, atmospheric transmission, and lidar calibration. By day, tenuous clouds and Saharan and boundary layer aerosols are retrieved at both wavelengths. By night, these constituents are retrieved, plus upper tropospheric, stratospheric, and mesospheric aerosols and noctilucent clouds. Density, temperature, and improved aerosol and cloud retrievals are simulated by combining signals at 0.35, 1.06, and 0.53 microns. Particiate contamination limits the technique to the cloud free upper troposphere and above. Error bars automatically show effect of this contamination, as well as errors in absolute density nonmalization, reference temperature or pressure, and the sources listed above. For nonvolcanic conditions, relative density profiles have rms errors of 0.54 to 2% in the upper troposphere and stratosphere. Temperature profiles have rms errors of 1.2 to 2.5 K and can define the tropopause to 0.5 km and higher wave structures to 1 or 2 km.

N82-11690/6 PC **A03**/MF **A01**
Environmental Research and Technology, Inc., Concord, MA.
Variations in Atmospheric Angular Momentum.
Technical Report, 1 Jan. 1976 - 31 Dec. 1980.
R. D. Rosen, and D. A. Salstein. Jun 81, 50p NASA-CR-166712, ERT-TR-A345-T1
Contract NAS5-25870

Twice-daily values of the atmosphere's angular momentum about the polar axis during the five years from 1976 through 1980 are presented in graphs and a table. The compilation is based on a global data set, incorporating 90 perent of the mass of the atmosphere. The relationship between changes in the angular momentum of the atmosphere and changes in the length of day is described, as are the main sources of error in the data. The variability in angular momentum is revealed in a preliminary fashion by means of a spectral decomposition. The data presented should stimulate comparisons with other measures of the length of day and so provide a basis for greater understanding of Earth-atmosphere interactions.

N82-11693/0 PC **A04**/MF **A01**
Indian Inst. of Geomagnetism, Bombay.
Geomagnetic Observations.
Annual Report, 1979 - 1980.
N. M. Marg. 1980, 70p

Results are summarized for the following areas of investigation: (1) quiet and disturbed day variation in the low and equatorial latitudes; (2) electromagnetic induction; (3) magnetosphere and solar wind; (4) aeronomy; (5) effects of the interplanetary magnetic field; (6) solar terrestrial relationships; (7) geomagnetic lunar daily variations; and (8) sola eclipse effects on HF radio propagation. Data processing, analysis, and dissemination activities are disussed as well as national and international cooperation in various projects including the International Magnetospheric study, the World Magnetic Archives Project, and MAGSAT.

N82-11697/1 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Meridional Heat Transport at the Onset of Winter Stratospheric Warming.
M. Conte. Sep 81, 10p NASA-TM-76614
Contract NASW-3541
Transl. into English from Rev. Di Meterol. Aeron., V. 40, Oct. - Dec., 1980 p 303-307. Transl. By Kanner (Leo) Associates, Redwood City, Calif. Original DOC. Prep. By National Aeronautical Meteorology and Climatology Center, Rome.

A continuous vertical flow of energy toward high altitude was verified. This process produced a dynamic instability of the stratospheric polar vortex. A meridional heat transport ws primed toward the north, which generated a warming trend.

N82-11723/5 PC **A05**/MF **A01**
Michigan Univ., Ann Arbor.
Time-Variable Earth's Albedo Model Characteristics and Applications to Satellite Sampling Errors.
Final Report.
F. L. Bartman. Sep 81, 78p NASA-CR-165781, REPT-0189219-1-F
Contract NAG1-67

Characteristics of the time variable Earth albedo model are described. With the cloud cover mulitplying factor adjusted to produce a global annual average albedo of 30.3, the global annual average cloud cover is 45.5 percent. Global annual average sunlit cloud cover is 48.5 percent; nighttime cloud cover is 42.7 percent. Month-to-month global average albedo is almost sinusoidal with maxima in June and December and minima in April and October. Month-to-month variation of sunlit cloud cover is similar, but not in all details. The diurnal variation of global albedo is greatest from November to March; the corresponding variation of sunlit cloud cover is greatest from May to October. Annual average zonal albedos and monthly average zonal albedos are in good agreement with satellite-measured values, with notable differences in the polar regions in some months and at 15 S. The albedo of some 10 deg by 10 deg. areas of the Earth versus zenith angle are described. Satellite albedo measurement sampling effects are described in local time and in Greenwich mean time.

N82-12016/3 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Radiation Balances and the Solar Constant.
D. Crommelynck. Jul 81, 21p NASA-TM-76612, ESA-SP-143
Contract NASW-3198
Transl. Into English from Proceedings of the Esa Tech. Conf. (France), 1979 p 137-143. Translation Was Announced as N80-21812. Transl. By Scientific Translation Service, Santa Barbara, Calif. Conf. Held in Lannion, France, 17-21 Sep. 1979.

The radiometric concepts are defined in order to consider various types of radiation balances and relate them to the diabetic form of the energy balance. Variability in space and time of the components of the radiation field are presented. A specific concept for sweeping which is tailored to the requirements is proposed. Finally, after establishing the truncated character of the present knowledge of the radiation balance, the results of the last observations of the solar constant are given. Ground and satellite measurement techniques are discussed.

PB82-859281 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Acid Precipitation. June, 1976-December, 1981 (Citations from the Energy Data Base).
Rept. for Jun 76-Dec 81.
Dec 81, 401p
Supersedes PB80-852296. Prepared in cooperation with the Department of Energy, Washington, DC.

Citations in this bibliography cover sources, causes, effects, and controls of acid rain, acid snow, and acidification of soils and fresh and salt water bodies. Coverage is mostly for the North American continent. (This updated bibliography contains 380 citations, 242 of which are new entries to the previous edition.)

4B. Meteorology

AD-A107 034/1 PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
Atmospheric Turbulence as a Function of Height above Various Surface Materials.
Interim rept.,
Daniel H. Garcia. 23 Sep 81, 23p Rept no. NRL-8518

The atmospheric refractive-index structure parameter C 2 sub n was determined at heights 0.5 to 5 meters above open-field grass, blacktop, concrete, and aluminized-Mylar sheets attached to plywood. Measurements were made of the temperature structure parameter with twin fast-response, temperature-sensing probes made of 2-micrometer diameter platinum wire which were separated 10 cm and optimally excited at 10 microwatts. The RMS value of the temperature difference between the probes was determined with R. W. Harris double-AC bridge/log-meter system. Probe height was changed approximately every 30 minutes. The differential temperature and the meteorological parameters comprising air temperature, dew point, wind speed and direction, solar insolation and barometric pressure were sampled at 1-second intervals. Results indicate a height dependence of the form C 2 sub n = KH to the minus M, where K is a function of the surface (0.84 < or = K/10 to the minus 13th power m to the minus 2/3 power < or = 1.8) and M = - 1.2 + or - 0.5, with the wide variation in M due to changing meteorological conditions, most importantly solar insolation and wind speed. In this experiment, no significant differences in average value of C 2 sub n could be determined for the four surfaces. Additionally, the anticipated reduction in turbulence over aluminized Mylar was not observed.

AD-A107 084/6 PC **A02**/MF **A01**
Army Electronics Research and Development Command, White Sands Missile Range, NM. Atmospheric Sciences Lab.
19304D MLRS, Missile Number BN-051, Round Number V-184/MD-40, 14 August 1981.
Meteorological data rept.,
Donald C. Keller. Aug 81, 23p Rept no. ERADCOM/ASL-DR-1204

Meteorological data gathered for the launching of the 19304D MLRS, Missile Number BN-051, Round Number V-184/MD-40 presented in tabular form. (Author)

AD-A107 094/5 PC **A04**/MF **A01**
Army Electronics Research and Development Command, White Sands Missile Range, NM. Atmospheric Sciences Lab.
Techniques for the Computation of Wind, Ceiling, and Extinction Coefficient Using Currently Acquired RPV Data.
Final rept.,
James L. Cogan. Jul 81, 62p Rept no. ERADCOM/ASL-TR-0093

Proper deployment and accurate targeting of precision guided munitions depend partly on knowledge of wind velocity, ceiling, and electro-optical extinction in the target area; and knowledge of wind in the target area is crucial for the correct placement of smoke munitions. Wind velocity, ceiling, and volume extinction coefficient in the data silent region near the target may be computed by methods developed in this report using only data currently acquired by a remotely piloted vehicle of the type now being developed for use by the Army. No new instrumentation is required. The required input consists of flight data and data from an onboard imaging system. (Author)

AD-A107 199/2 PC **A09**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Topographically Induced Diurnal Boundary Layer Oscillations: Two Dimensional Synoptic Scale Modeling.
Doctoral thesis,
David W. McLawhorn. Dec 79, 187p Rept no. AFIT-CI-79-269D
Grant NSF-ATM77-26094

A two dimensional boundary layer model is developed for the study of diurnal cycles in boundary layer convergence over synoptic scale sloping terrain and thermally inhomogeneous surfaces. To properly resolve the terrain configuration, a local terrain following coordinate system is developed. The local coordinate system has characteristics which are superior to the terrain following coordinate systems commonly used. Truncation errors are significantly reduced in the local system so variations in the flow field due to physical forcing are easily discernable from those due to truncation error. Also, it appears that the local system can resolve coarser terrain configurations under numerically stable conditions. The model exhibits a sensitivity to latitude. The phase of the maximum vertical velocities forecast by the model occurs six hours later at 22 deg N. vs. 38 deg N. The boundary layer model is apparently not very sensitive to radiative flux divergence calculations but did show a marked reaction to soil type. Both the amplitude and phase of the maximum vertical velocities are modified by changes in soil type. (Author)

AD-A107 280/0 PC **A09**/MF **A01**
Oklahoma State Univ., Stillwater. Electronics Lab.
Development of Instrumentation for Research Probes.
Final rept. 1 Feb 78-31 Jul 81,
Richard F. Buck. 31 Jul 81, 200p AFGL-TR-81-0203
Contract F19628-78-C-0033

This report summarizes the services supplied to the Air Force Geophysics Laboratories in support of the upper air research program. Personnel and equipment were supplied at a number of launch sites. Descriptions of airborne payload equipment and special ground support equipment are presented. Airborne equipment included telemetry and related apparatus, including both analog and digital systems. Ground support equipment included autotrack and manual antennas, trajectory determination systems with command capability and PCM decoding and display systems. (Author)

AD-A107 351/9 PC **A03**/MF **A01**
Army Electronics Research and Development Command, White Sands Missile Range, NM. Atmospheric Sciences Lab.
19315AT MLRS, Missile Numbers V13-002, V15-003, Round Numbers V-185/AT-9, V-186/AT-10, 18 August 1981.
Meteorological data rept.,
Donald C. Keller. Aug 81, 30p Rept no. ERADCOM/ASL-DR-1205

Meteorological data gathered for launching of the 19315 AT MLRS, Missile Numbers V13-002, V15-003 presented in tabular form. (Author)

AD-A107 415/2 MF **A01**
Army Electronics Research and Development Command, White Sands Missile Range, NM. Atmospheric Sciences Lab.
19304D MLRS, Missile Number V38-002, Round Number V-183/IW-2, 13 August 1981.
Meteorological data rept.,
Donald C. Keller. 13 Aug 81, 22p Rept no. ERADCOM/ASL-DR-1203A
Availability: Microfiche copies only.

Meteorological data gathered for the launching of the 19304D MLRS, Missile No. V-38-002, Round No. V-183/IW-2 presented in tabular form. (Author)

AD-A107 432/7 PC **A03**/MF **A01**
Weather Wing (1st), Hickam AFB, HI.
Terminal Forecast Reference Notebook, Camp Casey, Korea.
1 Aug 81, 44p 1WW/TFRN/81/002, AD-E850 104
Also contains information for Camp Stanley (OL-A) and Camp Stanton (OL-B). Original contains color plates: All DTIC and NTIS information will be in black and white.

This publication provides weather forecasting guidelines for Camp Casey, Camp Stanley, and Camp Stanton. All of which are located in the Republic of Korea. The types of guidelines contained in this study are: location, topography, local effects, weather impact on supported units, synoptic climatology, and terminal forecast work and preparation sheets. Also included are AWS Climatic Briefs for each station.

AD-A107 433/5 PC **A06**/MF **A01**
Weather Wing (1st), Hickam AFB, HI.
Terminal Forecast Reference Notebook, Osan AB, Korea.
30 Jun 81, 112p 1WW/TFRN/81/001, AD-E850 103
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

This publication provides weather forecasting guidelines for Osan AB, Korea. The types of information contained within these guidelines is location, topography, local effects customer requirements, and support provided, synoptic climatology, forecast studies, climatological data, synoptic case studies, and TAF work and preparation sheets.

AD-A107 434/3 PC **A05**/MF **A01**
Weather Wing (5th), Langley AFB, VA.
Terminal Forecast Reference Notebook, Fresno Air Terminal, California.
20 Apr 81, 79p 5WW/TFRN-81/004, AD-E850 101
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

This terminal forecast reference notebook is for Fresno Air Terminal, California. It describes the following topics concerning forecasting weather at Fresno: location, topography, and local effects; impact of weather on supported units; synoptic climatology; climatic aids; operationally significant forecast problems; approved forecast studies; rules-of-thumb; and special synoptic studies and references.

AD-A107 508/4 PC **A07**/MF **A01**
Naval Postgraduate School, Monterey, CA.
A Numerical Study of the Role of Air-Sea Fluxes in Extratropical Cyclogenesis.
Doctoral thesis,
Scott Alphonse Sandgathe. Sep 81, 135p

This study uses a numerical model to investigate the effect of the air-sea fluxes of sensible heat and moisture in extratropical cyclogenesis over the open ocean. The model is a sectorized version of the UCLA general circulation model including the Arakawa-Schubert cumulus parameterization scheme and the Randall version of the Deardorff planetary boundary layer parameterization. Idealized initial conditions are specified in the atmosphere and ocean that are typical of open-ocean fall and spring conditions. Adiabatic and diabatic model results are compared over a 15-day integration period. Diabatic processes, including the surface fluxes, cause a large reduction in low-level static stability during the initial cyclone growth period. This reduction in static stability, as well as the latent heat release, leads to the rapid growth of wave numbers 12 and 18 in the diabatic model experiment, while only wave number 6 is present in the adiabatic experiment. The growth of the cyclones is much more rapid in the diabatic experiment. However, cyclones in the adiabatic experiment attain similar maximum intensities as in the diabatic experiment, and undergo an analogous decay period.

AD-A107 511/8 PC **A05**/MF **A01**
Naval Postgraduate School, Monterey, CA.
A Two-Dimensional Finite Element Advection Model with Variable Resolution.
Master's thesis,
Mark Elwood Older, III . Jun 81, 83p

Many meteorological forecast applications require the use of grids that have a high resolution in a particular area of interest, while allowing coarser resolution elsewhere. Conventional finite difference models often use nested grids to this end. In recent years, finite element models have been offered as an alternative. In this study, the two-dimensional advection equation with diffusion is defined over a rectangular domain. The Galerkin technique is applied to linear basis functions on triangular elements. The model is tested to determine the sensitivity of the forecast to various nodal geometries. Both equilateral and right triangular elements are tested. It is found that the equilateral arrangement consistently yields a superior forecast. Other tests are conducted in which the resolution is varied smoothly versus abruptly over the domain. The smoothly varying case gives results that are dramatically improved over the abruptly varying case. Among the conclusions is the fact that, for a given maximum resolution, the more slowly and smoothly the element size is changed, the better the forecast obtained. (Author)

DE81024374 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Categorization of Nocturnal Drainage Flows in the Anderson Creek Valley.
P. H. Gudiksen, and J. J. Walton. Jun 81, 5p UCRL-85569, CONF-811104-2
Contract W-7405-ENG-48
AMS conference on mountain meterology, Steamboat Springs, CO, USA, 10 Nov 1981.

A network of eight meteorological towers was operated over about a one-year period within the Anderson Creek valley in the Geysers Geothermal Area of northern California. The purpose was to define the noctural wind and temperature structure along the valley's sloped surfaces for use in evaluating the frequency of drainage flows throughout the year and to assess the representativeness of the flows observed during the few nights that intensive studies were undertaken. (ERA citation 06:035402)

DE81024414 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Modeling a Multiple Tracer Release Experiment During Nocturnal Drainage Flow in Complex Terrain.
R. Lange. Jun 81, 9p UCRL-85724, CONF-811104-4
Contract W-7405-ENG-48
AMS conference on mountain meterology, Steamboat Springs, CO, USA, 10 Nov 1981.

The complex conditions posed by very localized winds and turbulence, rugged topography, variable surface roughness, strong vertical motions and gravity flow require a three-dimensional modeling approach to realistically simulate the dispersal of hydrogen sulfide injected into the atmosphere at the Geysers geothermal area. In this study the three-dimensional particle-in-cell numerical diffusion model ADPIC (Lange, 1973 and 1978) was used to simulate the transport and diffusion of two simultaneous, distinguishable fluorescent tracer releases into the nighttime drainage flow regimes of the Putah and Anderson Creeks in the Anderson Springs Valley during the night of July 24, 1979. (ERA citation 06:035430)

DE81024417 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Overview, Current Status, and Future Plans for the DOE Atmospheric Studies in Complex Terrain (ASCOT) Program.
M. H. Dickerson. Jun 81, 5p UCRL-85725, CONF-811104-3
Contract W-7405-ENG-48
AMS conference on mountain meterology, Steamboat Springs, CO, USA, 10 Nov 1981.

Several terrain-dominated air-flow phenomena affect the problem of pollutant transport over complex terrain. One of these in nocturnal valley drainage flow, chosen as the initial focus of the ASCOT program. For this study we chose the Geysers geothermal area in Northern California as the initial study site. Objectives for this study were defined as, (1) to augment the present knowledge of the physical mechanisms involved in the development, perpetuation, and breakup of nocturnal drainage flows; (2) to develop an integrated measurement and modeling methodology to perform air quality impact assessment and control strategies for energy development in areas subject to drainage flows; and (3) to provide the developed methodology with special applications to the H sub 2 S emissions associated with the Geysers geothermal development. This report summarizes the field and modeling efforts that have been conducted thus far and discusses preliminary results and future plans. (ERA citation 06:035431)

DE81024451 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Implication of Spatial Averaging in Complex Terrain Wind Studies.
W. M. Porch. 19 Jun 81, 8p UCRL-85525-Rev.1, CONF-811104-1(Rev.1)
Contract W-7405-ENG-48
AMS conference on mountain meterology, Steamboat Springs, CO, USA, 10 Nov 1981.

Studies of wind over complex terrain have been conducted at two different times at the Geyser's Geothermal Region of Northern California. These studies have included optical anemometers with spatial averaging (Lawrence et al., 1972) over path lengths of 0.6 to 1 km and conventional cup-vane anemometers. Most of the work described in this paper resulted from field studies conducted as a part of ASCOT (Dickerson and Gudiksen, 1980) experiments in July, 1979 and September, 1980. It represents an effort to use measurements of spatially averaged wind to obtain the average drainaged wind speed component down a small slopping valley with few locations with reasonable instrument exposure accessible to cup anemometers. By comparing the point and spatially averaged wind measurements, it was hoped that data periods could be chosen for numerical wind field model testing when the two measurements were similar. (ERA citation 06:035401)

DE81025366 PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Comparison of a Drainage Flow Model with the Data of Manins and Sawford.
C. G. Davis, and B. E. Freeman. 1981, 3p LA-UR-81-1932, CONF-811104-5
Contract W-7405-ENG-36
AMS conference on mountain meterology, Steamboat Springs, CO, USA, 10 Nov 1981.

SIGMET is a system of computer codes developed to simulate mesoscale meteorology in regions containing complex terrain. This study attempts to quantify the effects of temperature differences along valley slopes, vegetation, humidity, and large scale geostrophic winds. (ERA citation 06:035398)

DE81028744 PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Study of the Nocturnal Drainage Flow over a Sloping Plateau in North-Central New Mexico.
B. M. Bowen, J. M. Dewart, and F. G. Fernald. 1981, 9p LA-UR-81-2121, CONF-811104-6
Contract W-7405-ENG-36
AMS conference on mountain meterology, Steamboat Springs, CO, USA, 10 Nov 1981.

This paper analyzes the drainage winds at Los Alamos. In addition, other local winds at Los Alamos are discussed: (1) upslope wind, (2) mountain-valley wind, (3) downslope flow due to terrain-forced thunderstorms, and (4) strong nighttime winds due to inversion decoupling. (ERA citation 06:035399)

DE81030740 PC **A05**/MF **A01**
Geokinetics, Inc., Concord, CA.
Meteorological and Climatological Investigation: Review of January-June 1980 Investigative Period.
D. R. Lundberg, and H. K. L. Spradlin. Jul 81, 81p DOE/LC/10787-80
Contract FC20-78LC10787

Since January 1979, a meteorological and climatological investigation for the purpose of establishing a microclimatic baseline has been continuously conducted at the Geokinetics oil shale research facility in Eastern Utah. This report, however, presents the findings for only a six month segment (January 1-June 30, 1980) of that ongoing investigation. Included in this report is a description of the program design, the handling and interpretation of the data, and program improvement considerations recommended for inclusion into future segments of the investigation. (ERA citation 06:034313)

DE81030741 PC **A08**/MF **A01**
Geokinetics, Inc., Concord, CA.
Meteorological and Climatological Investigation: Review of January-June 1980 Investigative Report.
D. R. Lundberg, and H. K. L. Spradlin. Jul 81, 170p DOE/LC/10787-80-App.D-V.1
Contract FC20-78LC10787

Since January 1979, a meteorological and climatological investigation for the purpose of establishing a microclimatic baseline has been continuously conducted at the Geokinetics oil shale research facility in Eastern Utah. This report, however, presents the findings for only a six month segment (January 1 - June 30, 1980) of that ongoing investigation. This appendix to the meteorological and climatological investigation contains the WestAq data printouts. (ERA citation 06:034314)

LBL-8772 PC **A04**/MF **A01**
Jewson Enterprises, Menlo Park, CA.
Using DOE-2 at Lawrence Berkeley Laboratory.
Sep 79, 55p
Contract W-7405-ENG-48

The manual provides directions for the DOE-2 user to run DOE-2 and its utility programs at LBL. After basic instructions are provided in Section 1, Section 2 provides storage and retrieving information for DOE-2 data for re-use. Additional information is provided on using interactive terminals; preparing your own weather file for DOE-2 use; and obtaining response factor calculations. (ERA citation 05:005805)

N82-11724/3 PC **A04**/MF **A01**
Howard Univ., Washington, DC. Dept. of Mathematics.
Some Analysis on the Diurnal Variation of Rainfall over the Atlantic Ocean.
T. Gill, S. Perng, and A. Hughes. Aug 81, 55p NASA-CR-164937
Grant NSG-5295

Data collected from the GARP Atlantic Tropical Experiment (GATE) was examined. The data were collected from 10,000 grid points arranged as a 100 x 100 array; each grid covered a 4 square km area. The amount of rainfall was measured every 15 minutes during the experiment periods using c-band radars. Two types of analyses were performed on the data: analysis of diurnal variation was done on each of grid points based on the rainfall averages at noon and at midnight, and time series analysis on selected grid points based on the hourly averages of rainfall. Since there are no known distribution model which best describes the rainfall amount, nonparametric methods were used to examine the diurnal variation. Kolmogorov-Smirnov test was used to test if the rainfalls at noon and at midnight have the same statistical distribution. Wilcoxon signed-rank test was used to test if the noon rainfall is heavier than, equal to, or lighter than the midnight rainfall. These tests were done on each of the 10,000 grid points at which the data are available.

N82-11725/0 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Evaluation of Photogrammetric Flight under Icing Conditions on March 23, 1978.
W. Fuchs, and J. Kaluza. Sep 81, 43p NASA-TM-76617
Contract NASW-3541
Transl. Into English of Ber. Fuer den Geophysikalischen Beratungsdienst der Bundeswehr, Traben-Trarbach (Germany, F.R.). No. 28, 1980 p 1-50. Transl. By Kanner (Leo) Associates, Redwood City, Calif.

In a double passage through a route laid out in a stagnaton zone of the Bavarian forest, it was found that the stagnation and attendant elevation increases the danger of icing. Conversely, it turned out that formation of precipitation reduces the icing intensity. A comparison of both factors showed: the reduction of ice formation through precipitation equals the increase due to stagnation, or even exceeds it.

PB82-107335 PC **A02**/MF **A01**
Intermountain Forest and Range Experiment Station, Ogden, UT.
Remote Automatic Weather Station for Resource and Fire Management Agencies.
General technical rept.,
John R. Warren, and Dale L. Vance. Aug 81, 15p FSGTR/INT-116

A weather station that operates automatically in remote areas, without power or communication lines, has been developed and is now commercially available. Remote Automatic Weather Stations (RAWS) transmit precipitation, windspeed, air temperature, fuel temperature, humidity, and barometric pressure data via satellite. Data is received at Wallops Island, VA., and stored at the World Weather Building, Maryland. Data may be acquired by direct dialing or through the AFFIRMS fire forecasting program of the USDA Forest Service.

PB82-132564 PC **A02**/MF **A01**
Washington Univ., Seattle. Dept. of Atmospheric Sciences.
Observations of the Modification of Cloud Condensation Nuclei in Wave Clouds.
Journal article,
Dean A. Hegg, Peter V. Hobbs, and Lawrence F. Radke. 1980, 8p CONTRIB-560, EPA-600/J-80-359
Grant PHS-HS-805263
Pub. in Jnl. de Recherches Atmospheriques 14, p217-222 1980.

Measurements are presented which show enhanced concentrations of cloud condensation nuclei, active at various supersaturations, downwind of wave clouds. Concurrent measurements of particle size spectra corroborate these measurements and suggest particle growth within the clouds. Modifications in the particle size spectra are most pronounced at diameters of approximately 1 micrometer. Measurements and modeling results suggest these observations can be explained by sulfate production in clouds.

PB82-136607 PC **A13**/MF **A01**
North American Weather Consultants, Salt Lake City, UT.
Continuing Design Work for the Sierra Cooperative Pilot Project: Interim Report No. 4,
R. D. Elliott, D. A. Griffith, John A. Flueck, and Jack A. Hannaford. Sep 81, 287p SLWM-81-3
Contract DI-7-07-83-V0008
Prepared in cooperation with Flueck Associates, Wynote, PA., and Sierra Hydrotech, Placerville, CA.

This research was concerned with continuing design work on the Sierra Cooperative Pilot Project (SCPP) being sponsored by the Bureau of Reclamation in the northern Sierra Nevada of California and Nevada. Seeding scenarios are presented for aerial curtain seeding of major precipitation bands and for ground based seeding of post-frontal convective cells. It has been determined that major bands commonly occur in the SCPP target area. The seeding scenarios deal with recommended treatment modes as well as estimates of potential cloud seeding effects.

PB82-802588 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Fog Prediction. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 193p
Supersedes PB80-813959, and NTIS/PS-79/0820.

Methods for predicting the possibility of fog formation and forecasting the eventual natural dissipation of fog are investigated. Worldwide climatic conditions conducive to the probability of fog in specific geographic areas are observed. (This updated bibliography contains 185 citations, 6 of which are new entries to the previous edition.)

5.
BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-A106 830/3 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Still No Progress in Implementing Controls over Contracts and Grants with Indians.
10 Sep 81, 96p Rept no. GAO/CED-81-122

Report to the Chairman, Committee on Interior and Insular Affairs, House of Representatives.

On January 3, 1980, the Chairman of the House Committee on Interior and Insular Affairs requested that we review the accountability of Federal funds and property used in Government contracts and grants with Indian tribes. The Chairman asked for recommended solutions to problems identified in our February 1978 report entitled 'Controls Are Needed Over Indian Self-Determination Contracts, Grants, and Training and Technical Assistance Activities To Insure Required Services Are Provided to Indians' (CED-78-44, Feb. 15, 1978). In our February 1978 report was stated that the Bureau of Indian Affairs (BIA) did not have adequate control over contracts, grants, and technical assistance activities authorized by Title I of the Indian Self-Determination and Education Assistance Act. We agreed to determine if the situation has improved at BIA and if other Federal agencies are having the same problems. (Author)

AD-A106 837/8 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Conrail Needs to Further Improve Inventory Control and Management.
4 Sep 81, 64p Rept no. GAO/CED-81-140
Report to the Congress.

This report discusses problems the Consolidated Rail Corporation (Conrail) has in controlling and managing its inventory of materials and supplies used in rehabilitating and maintaining its track system and makes several recommendations aimed at strengthening inventory controls. Conrail has made some progress in this area, but more needs to be done.

AD-A106 839/4 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
SBA's 7(j) Management Assistance Program: Changes Needed to Improve Efficiency and Effectiveness.
29 Sep 81, 58p Rept no. GAO/CED-81-149
Report to the Congress.

This report, which was prepared pursuant to Public Law 95-507, discusses the Small Business Administration's 7(j) Management Assistance Program. The report discusses the need for better program planning and management and recommends that the Small Business Administration make a number of improvements. (Author)

AD-A106 840/2 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
SBA's Progress in Implementing the Public Law 95-507 Subcontracting and Surety Bond Waiver Provisions has been Limited.
18 Sep 81, 34p Rept no. GAO/CED-81-151
Report to the Congress.

This report describes actions taken by (1) the Small Business Administration (SBA) and the Presidential Advisory Committee to promote subcontracting as a means of developing small and small minority businesses and (2) SBA to implement the surety bond waiver provision of Public Law 95-507. This law requires us to evaluate several SBA programs and report the results to the Congress. (Author)

AD-A106 858/4 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Program Analysis Div.
Progress in Improving Program and Budget Information for Congressional Use.
1 Sep 81, 29p Rept no. GAO/PAD-81-88
Report to the Congress.

This report is submitted to the Congress in accordance with section 202 (e) of the Legislative Reorganization Act of 1970. This section requires us to report annually on the progress and results of our continuing program, undertaken in accordance with the 1970 Act, as amended by Title VIII of the Congressional Budget Act of 1974, to improve the fiscal, budgetary, and program-related data and information reported to the Congress. The relevant statutory provisions assign GAO responsibilities for: developing standard terminology, definitions, classifications, and codes for Federal fiscal, budgetary, and program-related data and information reported to the Congress; conducting a continuing program for identifying and specifying the needs of the Congress for fiscal, budgetary, and program-related information; monitoring the recurring reporting requirements of the Congress and making recommendations for changes and improvements in such requirements; maintaining inventories and directories of sources and information systems containing fiscal, budgetary, and program-related data and information; maintaining central files of Federal fiscal, budgetary, and program-related data and information to meet the recurring requirements of the Congress; evaluating the extent to which the executive branch reporting meets identified information needs and specifying the changes required to meet congressional needs; cooperating with the executive branch in standardization of the budget, fiscal, and program-related information systems; and cooperating with the executive branch in meeting the needs of State and local governments for budget, fiscal, and program-related information. (Author)

AD-A106 868/3 PC **A08**/MF **A01**
Army Industrial Base Engineering Activity, Rock Island, IL.
Manufacturing Methods and Technology Project Execution Report.
Semiannual rept. 1 Jan-30 Jun 81,
L. S. Hancock. Aug 81, 161p AD-E700 003

This document is a summary compilation of the Manufacturing Methods and Technology Program Project Status Reports (RCS DRCMT-301) submitted to IBEA from DARCOM major Army subcommands and project managers. Each page of the computerized section lists project number, title, status, funding, and projected completion data. Summary pages give information relating to the overall DARCOM program.

AD-A106 871/7 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Concerns about HHS' Ability to Effectively Implement Incentive Funding for State Information Systems in the Aid to Families with Dependent Children Program.
29 Jun 81, 16p Rept no. GAO/HRD-81-119

Public Law 96-265, enacted on June 9, 1980, authorized the Federal Government, beginning on July 1, 1981, to pay 90 percent of the costs incurred by States for the planning, design, development, or installation of statewide mechanized claims processing and information retrieval systems for administering the $11.3 billion Aid to Families with Dependent Children (AFDC) program. The Federal Government currently pays 50 percent of both development and operating costs related to these systems. Public Law 96-265 contained several specific conditions for obtaining increased Federal matching funds. First, the system must operate on a statewide basis; control all factors in the eligibility determination process; control and account for the costs, quality, and delivery of funds and services furnished to applicants and recipients; provide eligibility information to other welfare programs; and provide security against unauthorized access to data in the system. Second, the Secretary of the Department of Health and Human Services (HHS) must determine that the system is likely to provide more efficient and effective administration of the AFDC program and be compatible with systems used to administer Social Services programs and Medicaid. (Author)

AD-A106 873/3 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Injury Compensation Process Delays Prompt Payment of Benefits to Federal Workers.
25 Sep 81, 66p Rept no. GAO/HRD-81-123
Report to the Congress.

This report discusses claims processing problems that are delaying the prompt payment of benefits under the Federal Employees' Compensation Act. Federal workers who sustain employment-related injuries have remedy against the Government only by the act, and prompt payment of benefits is necessary for them to avoid financial hardship. (Author)

AD-A106 875/8 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
The Guaranteed Student Loan Information System Needs a Thorough Redesign to Account for the Expenditure of Billions.
24 Sep 81, 49p Rept no. GAO/HRD-81-139

This report discusses attempts by the Department of Health, Education, and Welfare, and more recently the Department of Education, to develop and operate an automated information system for the Guaranteed Student Loan program and makes several recommendations to the Secretary of Education to improve these efforts. As your Subcommittee requested in April 1979, our review focused on (1) the Departments' efforts and plans to correct system deficiencies, (2) the reasonableness and proprietary of major system costs incurred, and (3) the contractor's performance under the most recent system contract awarded in April 1979. (Author)

AD-A106 880/8 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. International Div.
Management of the Department of State Office of Passport Services Needs to be Improved.
6 Aug 81, 63p Rept no. GAO/ID-81-39
Report to the Secretary of State.

This report contains recommendations to you on pages 12, 24, 32, 41, 44, 48, and 49. As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report. (Author)

AD-A106 882/4 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Ineffective Management of the Appropriate Technology Small Grants Program.
15 Sep 81, 10p Rept no. GAO/EMD-81-113

Energy-related appropriate technologies are those which are small-scale and labor-intensive, use locally available resources, reduce reliance on scarce or nonrenewable energy resources, and are environmentally sound. The development and application of these technologies can increase the mix of energy options available to individuals and the Nation by providing alternatives to capital-intensive, centralized energy technologies; reduce energy costs to individuals; provide employment opportunities; and increase local self-reliance.

AD-A106 888/1 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Analysis of Federal Funding for Electric Utility R&D Projects.
28 Sep 81, 10p Rept no. GAO/EMD-81-145

While it is preferable to have the private sector carry out demonstrations, our work indicates that, because of the uniqueness of the electric utility industry, this may not occur. Because of the large costs of demonstrating new technologies, the unique factors affecting the industry such as rate regulation, and its present financial burdens, the Federal policy toward electric utility R&D may have to be viewed in a different context. (Author)

AD-A106 893/1 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Procurement, Logistics, and Readiness Div.
Allegations of Unfair Bidding Requirements at Griffiss Air Force Base, Rome, New York.
1 Sep 81, 2p Rept no. GAO/PLRD-81-63

We found that the procedures followed by Griffiss comply with existing Defense Acquisition Regulations which require a performance bond for any fixed-price construction contract in excess of $25,000. The same regulations require a bid guarantee of not less than 20 percent of the bid amount. The bid guarantee may take the form of a bid bond, postal money order, certified check, cashiers check, irrevocable letter of credit, or certain bonds or notes of the United States. In Mr. Harvey's case, in lieu of a bid bond, which he says he cannot secure, the guarantee would have to be in one of the other forms mentioned above.

AD-A106 894/9 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Procurement, Logistics, and Readiness Div.

Inquiry Concerning Denial of Contracts to Low Offeror for Army Translation Services.
18 Sep 81, 8p Rept no. GAO/PLRD-81-66

This report is in reply to your joint letter of January 29, 1981, in which you provided us with a series of articles published in a Tennessee newspaper--the Kingsport Times-News--in early January 1981. These articles questioned the Army's bidding practices in awarding purchase orders for language translation services. You asked us to investigate allegations regarding whether your constituent's low bids for translation work were regularly passed over; your constituent was denied contracts without explanation; and there was any evidence of fraud, conflict of interest, deception, or improper circumvention of Army procurement regulations. (Author)

AD-A106 895/6 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Procurement, Logistics, and Readiness Div.
HUD's Oversight of Procurement by Public Housing Authorities Needs Strengthening.
30 Sep 81, 2p Rept no. GAO/PLRD-81-68

In summary, we found that personnel responsible for procurement at the six housing authorities frequently lacked the skills and knowledge about the techniques needed to make efficient and economical buys. As a result, there was no assurance that competition was being obtained to the maximum extent feasible or that payments were being made for goods actually delivered or for services actually performed. We also found that your agency's periodic reviews of the authorities' procurement practices did not disclose the situations we found. We believe this happened because HUD's guidance is much too general to its staff charged with making these periodic reviews. (Author)

AD-A106 940/0 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
GAO Comments on the Impact of the USDA Reorganization of Nutrition.
17 Aug 81, 13p Rept no. GAO/CED-81-150

This letter responses to the June 24, 1981, request for comments on the June 1981 reorganization of the U.S. Department of Agriculture (USDA) and its impact on nutrition. As requested, comments on the reorganization address those areas that relate to USDA's nutrition responsibilities and activities. USDA is in the process of implementing the reorganization and identifying, addressing, and resolving the management and policy problems that occur with any reorganization. Also, details of USDA's nutrition policies have not been fully formulated. As a result, comments are based primarily on what USDA officials have told us and on the opinions of professionals from the nutrition community. Because the reorganization is just now being implemented, we are unable to reach any conclusions on the reorganization's impact on USDA's nutrition responsibilities nor on the broader impact on nutrition research, information and education. Any reorganization can be expected to disrupt operations in the short-run and affect the momentum in nutrition that had been established over the last few years. Whether that momentum continues under the new reorganization remains to be seen.

AD-A107 007/7 Not available NTIS
Texas Univ. at Austin. Center for Cybernetic Studies.
Evaluating Program and Managerial Efficiency: An Application of Data Envelopment Analysis to Program Follow Through,
A. Charnes, W. W. Cooper, and E. Rhodes. 13 Mar 79, 32p
Contract N00014-75-C-0616
Prepared in cooperation with Carnegie-Mellon Univ., School of Urban and Public Affairs.
Availability: Pub. in Management Science, v27 n6 p668-697 Jun 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 033/3 PC **A09**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Systems and Logistics.
An Examination of Year-End Spending with Regard to Department of Defense Contract Awards.
Master's thesis,
James M. Farrell, and Paul K. Spendley. Jun 81, 186p Rept no. AFIT-LSSR-40-81

Investigations conducted by Congress and the General Accounting Office have indicated that a number of Federal agencies, including the Department of Defense (DOD), engage in a year-end spending practice which potentially wastes billions of tax dollars annually. This practice is commonly known as year-end spending surge. The objective of this research was to analyze DOD contract award data to determine the magnitude of any year-end spending surge and to identify the types of procurement activities and the types of commodities involved in the surge. Data pertaining to DOD and Air Force (USAF) contract awards to U.S. business were analyzed for fiscal years 1977 through 1980. The authors concluded that the DOD and the USAF experienced a year-end spending surge. Further, each type of procurement activity examined had a unique award pattern, and not all activities experienced year-end surge. For the USAF, the magnitude of surge of base procurement was the major influence on the magnitude of the USAF surge. The study also includes information concerning the possible influence of appropriations and supplemental appropriations on the DOD year-end surge. Additionally, an examination of DOD award patterns from fiscal years 1952 through 1976 is presented in an appendix. (Author)

AD-A107 086/1 PC **A02**/MF **A01**
University of Southern California, Los Angeles. Dept. of Management.
Applications of Renewal Theory in Analysis of the Free-Replacement Warranty,
Wallace R. Blischke, and Ernest M. Scheuer. 1981, 16p
Contract N00014-75-C-0733
Pub. in Naval Research Logistics Quarterly, v28 n2 p193-205 Jun 81.

No abstract available.

AD-A107 175/2 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Procurement, Logistics, and Readiness Div.
Review of Government-Wide Contracting Systems for Film and Videotape Productions.
21 Sep 81, 3p Rept no. GAO/PLRD-81-61

We recommend that you request agencies to increase their efforts to provide accurate and complete data and urge them to verify their reports to insure completeness and accuracy. We also recommend that you direct Directorate managers to compare the number and value of contract awards made through the uniform, Government-wide contracting systems with the total number and value of all Federal film and videotape contracting and to take corrective action where appropriate.

AD-A107 176/0 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Procurement, Logistics, and Readiness Div.
Allegations of Unethical Bidding Practices on Federal Construction Contracts.
9 Sep 81, 2p Rept no. GAO/PLRD-81-64

In a May 21, 1981, letter, the honorable Leon E. Panetta asked GAO to investigate a constituent's complaint concerning unethical bidding practices by construction contractors bidding on Federal projects. This report provides some background on the bidding controversy and our views on the solutions proposed by your constituent.

AD-A107 187/7 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Accounting and Financial Management Div.
Examination of the Effectiveness of Statutory Offices of Inspector General.
21 Aug 81, 11p Rept no. GAO/AFMD-81-94

This report is in response to your July 14, 1980, request for a review of the 15 statutory offices of inspector general. It is a follow-up on the briefing we gave you on May 21. Based on an agreement made during our initial meeting with your staff, we did preliminary auditing at several offices, identified potential review areas, and developed a review methodology for each area. We subsequently discussed the areas with your staff and together selected the following five: (1) Funding and staffing restrictions, (2) Resource and coordination problems due to agency audit and investigative activities that operate outside the inspector general organizations, (3) Weak vulnerability assessment programs, (4) Problems with agency follow-up systems for handling GAO 'hot-line allegations referred for inspector general action, and (5) Questionable usefulness of inspector general reports to the Congress.

AD-A107 188/5 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Accounting and Financial Management Div.
Terminating the Audit of the National Flood Insurance Program's Fiscal 1980 Financial Statements.
21 Sep 81, 8p Rept no. GAO/AFMD-81-93

In summary, a financial reporting system was to have been in place that should have enabled FEMA (Federal Emergency Management Agency) to effectively carry out its responsibilities under the Government Corporation Control Act. EDSF (Electronic Data Systems Federal Corporation) was to provide the necessary monthly reports of NFIP's (National Flood Insurance Program) insurance operations; FIA (Federal Insurance Administration), as program monitor, was to assure that EDSP provided accurate, complete, and timely data; and FEMA was to incorporate the financial information into its own accounting system for later reporting needs, including preparation of NFIP financial statements. The inability to prepare financial statements reflects negatively on the adequency of NFIP's accounting system, the financial management of the program, and management's commitment to a sound system of internal accounting controls. This is due to the following weaknesses: (1) FEMA Accounting did not carry out its accounting control responsibilities for the Flood Program, (2) The contract with the insurance program operator, EDSF, did not specify essential controls and financial reports, (3) EDSF did not maintain adequate accounting controls over financial reporting; and (4) FIA did not adequately monitor EDSF operations.

AD-A107 259/4 PC **A06**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Office of Management and Budget Circular Number A-76 as a Statement of Federal Procurement Policy.
Master's thesis,
David John Kuckleman. 17 Feb 81, 124p Rept no. AFIT-CI-81-10T

This thesis examines the Office of Management and Budget Circular No. A-76(1979) from an historical perspective. The scope includes identification of the problem of Government competition with private enterprise and the need for a national policy; the three, co-equal precepts embodies in the revised Circular A-76; and the enforceability of Circular No. A-76 through the process of internal audits or reviews. (Author)

AD-A107 277/6 PC **A03**/MF **A01**
General Research Corp., Mclean, VA.
Mission Impact Generalized Explanatory Base Operating Support Model Development: Final Management Summary.
Final technical paper 1 Dec 80-30 Jun 81,
Edward J. Schmitz, Roy E. Smoker, and John N. Taylor. Sep 81, 37p AFHRL-TP-81-30
Contract F33615-80-C-0023

The Mission Impact Generalized Explanatory Base Operating Support Model (GEBOS-M) can compute Air Force Major Command (MAJCOM) Base Operating Support (BOS) and Real Property Maintenance Activities (RPMA) manpower requirements directly from programmed changes in mission elements. GEBOS-M provides manpower managers with a quick turnaround capability to program and justify base level support manpower changes in functional category level of detail, tied directly to changes in mission capability. This test model applies to Strategic Air Command (SAC), Tactical Air Command (TAC), and Air Training Command (ATC)/U.S. Air Force Academy (USAFA). With further work, it can be extended to apply Air Force-wide. Initial validation tests were completed. They demonstrated consistent and reliable relationships between primary mission activities and their supporting BOS/RPMA workload and manpower levels. The supporting manpower and workload elements addressed by the model include all Department of Defense (DOD) functional categories comprising the BOS/RPMA program elements. (Author)

AD-A107 284/2 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Mission Analysis and Acquisition Div.

Budgetary Pressures Created by the Army's Plans to Procure New Major Weapon Systems are Just Beginning.
20 Oct 81, 32p Rept no. GAO/MASAD-82-5
Report to the Congress.

The Army is now facing the problem of funding the procurement of all 14 of its new major weapon systems. Recent experience has shown that as new Army weapons begin production, procurement costs run considerably higher than anticipated. Since 11 of the 14 weapon systems have not yet gained any significant production experience, their cost estimates are likely to be on the low side. Fielding all 14 new systems during the next decade is likely to seriously strain the Army's operation and support resources since, compared to present weapons, these systems will require more people with higher skills, as well as increased expenditures for fuel, spares, and ammunition. GAO recommends improvements in planning for the procurement and eventual support of these weapon systems to alleviate the future budgetary strains they could impose. (Author)

AD-A107 313/9 PC **A07**/MF **A01**
Air War Coll., Maxwell AFB, AL.
U.S. Technology Transfer to the Soviet Union: A Dilemma.
Research rept.,
Rodney P. G. Bricker. Apr 81, 146p Rept no. MS094-81

The transfer of technology from the U.S. to the Soviets started to accelerate during the Nixon administration. The pace increased even more briskly through the first three years of the Carter Administration. Today, the entire question of technology transfer is under serious discussion. What is the status now. What is the role of the Departments of Defense. What are the interests of the Commerce Department and the Department of State. Does the nation need an Office of Strategic Trade to control the movement of strategic commodities and critical technologies. This study examines the background of the past 10 years of technology transfer, the Bucy Report then and now, activities at the Department of State, Commerce, and Defense, the role of the FBI and of the National Technical Information Service, describes a typical tough technology transfer review, gives the Soviet perspective, and looks at many Soviet visitors who are 'students.' The proposed Office of Strategic Trade is explained and proposed as one solution to the problem derived from many points of view, while another equally manageable and effective approach aimed at refining the present organization and keeping the responsibility in the Department of Commerce also is discussed.

AD-A107 375/8 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Allocation of an Air Force Contractor's Pension Fund Assets May be Inequitable.
23 Sep 81, 5p Rept no. GAO/HRD-81-152

During our review of contractor's compliance with cost accounting standards relating to pension costs, we found that the pension plan for Pan American World Airways, Inc. (Pan Am), had experienced significant actuarial gains from unanticipated job terminations of employees working on an Air Force contract. At the time of our fieldwork in 1979, Pan Am had initiated actions to establish separate pension plans which would ensure that the Government received proper credit for these termination gains. However, as of July 1981, these actions had not been completed and it appears that the method proposed by Pan Am for allocating pension plan assets may not be equitable to the Government. We believe that you should act to ensure that the pension plan established for employees working on Government projects receives an equitable share of assets. (Author)

AD-A107 376/6 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Program Analysis Div.
Status Report on Implementation of GAO's Audit Findings and Recommendations.
10 Sep 81, 32p Rept no. GAO/PAD-81-87

Contents: Delinquent accounts and loans receivable, Unpaid taxes, Unresolved audit findings, Paperwork reduction, Defense logistical economies, Defense multi-year contracting, Full cost recovery for foreign military sales, Workforce cost control, General procurement practices, and Replacing obsolete computers.

AD-A107 402/0 PC **A03**/MF **A01**
Meridian Corp., Falls Church, VA.
Preliminary Analysis of Technical Risk and Cost Uncertainty in Selected DARPA Programs.
Final rept.
6 Oct 81, 37p
Contract MDA903-81-C-0375, DARPA Order-4287
Supersedes report dated 30 Sep 81, AD-A105 671.

This report documents the analytical results and conclusions of a four-month investigation of cost and uncertainty in selected DARPA programs. The analysis focuses on risk and the management of risk from a technical, cost, and schedule perspective through a comparison of DARPA experience to a large experience base of other federal programs. The results indicate that DARPA experience in the management of high technology programs can be interpreted (and to some degree of accuracy, forecasted) using this experience base. In addition, this analytical and empirical approach can be used to assist DARPA in complying with recent DOD directives to recognize risk in budgeting and planning estimates. Most importantly, the study effort demonstrates that it is possible to identify qualitative indicators to characterize risk and to use such descriptors as the basis for risk management.

AD-A107 450/9 PC **A08**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Systems and Logistics.
Implementation of Subcontracting Provisions of Public Law 95-507 within Air Force Logistics Command and Air Force Systems Command.
Master's thesis,
Shawn F. Graves, and William D. Ritchie. Jun 81, 175p Rept no. AFIT-LSSR-17-81

Following the passage of PL95-507 in October, 1978 there has been continued controversy among the lawmakers, DOD, SBA, and industry as to the overall support of the program. Especially noteworthy is the effect and utilization of the subcontracting plans required by law. This study narrows the scope of the problem to the implementation of the law through the use of the current Air Force Guidelines. The objectives are to validate the guidelines and analyze any weaknesses discovered. The researchers conclude that the current guidelines do effectively implement the law. However, it is recommended that better communication be established between contracting officials and SBA and a clarification of ambiguous and redundant wording in the guidelines be made. Additionally, both reporting and records requirements need to be standardized and new policy statements need to be incorporated into the guidelines. Specifically, guidelines 6, 7, 8, 9, 16 and 23 need to be rewritten/expanded for ease of user interpretation and litigation.

AD-A107 465/7 PC **A03**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Systems and Logistics.
Determination of Contract Suitability to the Award Fee Concept.
Master's thesis,
Holly R. McLelland, and David D. Odor. Jun 81, 50p Rept no. AFIT-LSSR-27-81

The concept of the Award Fee contract has existed within the federal government since the 1950s. The Navy and the National Aeronautical and Space Administration used Award Fee contracts on a limited basis in the early 1960s. The Air Force still considered their use experimental as late as 1978. In FY 79 Award fee accounted for 2.9 percent of all contracts over $10,000, and totaled over $1.5 billion. An estimate of the government's administrative costs for a moderate-sized Award Fee program was $115,000 annually. The burden of the administrative costs is considered to be justified when the government realizes greater benefits as a result of the Award Fee provision. There is a general lack of definitive guidance for evaluating the suitability of any contract to the Award Fee concept. With no formalized guidelines for the selection of a contract, there is no objective way to judge the possible, or probable, cost to benefit ratio of a given contract.

AD-A107 478/0 PC **A03**/MF **A01**
Naval Postgraduate School, Monterey, CA.
ADPE Acquisition: The Acquisition of the Naval Postgraduate School Computer, A Case Study.
Master's thesis,
John Earl Boyle. Sep 81, 48p

The federal computer acquisition process is examined by studying one particular major computer system acquisition. The manner in which the principals involved conducted the acquisition in relation to the political and regulatory environment is examined and displayed in a case study format. Although the situational facts involve a computer acquisition for the Naval Postgraduate School, broad issues are developed which apply universally to public and private sector computer systems acquisition. The case exposes the reader to the issues of specification development, conversion costs, benchmark testing, and the role of competition in computer acquisition. Attention is focused on the environment in which a computer system need is developed and how that need is 'marketed' through the review and support process of a large organizational buying system.

AD-A107 496/2 PC **A08**/MF **A01**
Booz-Allen and Hamilton, Inc., Bethesda, MD.
The Relationship between Adequacy of Test and Evaluation Data and DS ARC Decisions.
1 Jun 81, 174p
Contract MDA903-80-C-0591

The objective of this research was to gain a better understanding of how the adequacy of test and evaluation (T and E) data affects defense system acquisition review council (DSARC) decisions. Specifically, the study focused on the adequacy of the T and E data presented at milestone reviews as a possible reason for conditional decisions. Conditional decisions are those that nominally approve entry into the next phase of acquisition, but also impose restrictions on the pace of development or rate of production. Such restrictions invariably increase the time and cost of the acquisition process. This study showed that while most milestone II and III decisions are, in fact, made conditionally, the adequacy of T and E is not the predominant factor. However, when DSARC issues do arise which involve the quantity or quality of T and E data available for decision-making, it is generally because of a lack of communication between OSD and the services. Clarification of milestone review policies, early identification of T and E issues associated with the selected acquisition strategy, and vigorous use of the test and evaluation master plan (TEMP) are some of the ways this aspect of the acquisition process can be improved in the present environments of decentralized operations and centralized decision-making. (Author)

DE81030405 PC **A02**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Plant.
Operating-Procedure System at Savannah River Plant.
C. W. Tope. May 81, 6p DPSPU-80-30-13, CONF-810508-3
Contract AC09-76SR00001
28. international technical communication conference, Pittsburgh, PA, USA, 20 May 1981.

Three types of procedures are widely used at SRP: Du Pont Savannah Operating Logsheet, Du Pont Savannah Operating Procedure, and Plant Manual. This document briefly reviews originating of the procedures, their preparation, control, and indexing. (ERA citation 06:035761)

DE82000045 PC **A09**/MF **A01**
Department of Energy, Washington, DC. Office of Procurement Operations.
Autopreps Data Base for Cost-Reimbursement Support Services or Nonnuclear R and D Procurements.
Sep 81, 178p DOE/MA-0025

No abstract available.

ORNL/TM-6428 PC **A06**/MF **A01**
Oak Ridge National Lab., TN.
ORNL Direct Purchase Information System (DPIS) User's Manual.
J. W. Grubb, J. K. Lovin, M. B. Smith, R. L. Haese, and D. B. Needham. Aug 80, 106p
Contract W-7405-ENG-26

The ORNL Management Information System (MIS) Direct Purchase Information System (DPIS) is an online interactive system of computer programs. The system can provide a manager with commitment and delivery schedule information on current direct purchase requisitions. The commitment data accounts for the orders that have been placed and those requisitions yet to be placed with a vendor. Information can be summarized at many different levels, and individ-

uals can quickly determine the status of their requisitions. DPIS contains data only on active outside direct purchases, but has the capability to access historical data. It provides sufficient flexibility to be used to answer many questions pertinent to the status of these direct purchases and their obligating costs. Even an inexperienced computer user should have little difficulty in learning to use DPIS. The User Module prompts the user on what type of response it is expecting. If the user has doubts as to the response, or if the meaning of the response is not clear, the module will give a detailed list of the options available at that level. The user has control of what data are to be considered, how they are to be grouped, and what format the output will take. As the user selects the options available at a given level, the module proceeds to the next lower level until sufficient input has been supplied to provide the requested information. A major benefit of this interactive, user-oriented system is that the manager can specify the information requirements and does not have to spend time going through a great deal of other data to locate what is needed. Because it is interactive, a search can begin at a summary level and then resort to a more detailed level if needed. DPIS allows the user direct control for selecting the type of commitment data, output, funds, and direct purchase. (ERA citation 05:033152)

PB82-107889 PC **A06**/MF **A01**
National Eye Inst., Bethesda, MD.
Anatomy and Assessment of Program Planning at the National Eye Institute,
Helen M. Riches. Jan 81, 108p NEI-80-301

Although the National Eye Institute and the National Advisory Eye Council have performed evaluation and planning activities and have produced several such documents over the past five years, there has never been systematic and comprehensive description of the history and development of these activities or an assessment of their efficacy. By means of summarizing previously published materials the contractor has produced a history and description of the NEI's comprehensive program evaluation and planning activity, and an assessment of NEI evaluation and planning strategy and process from its inception through the development of the five-year plan for the years 1978-1982. This project has produced a document that presents an integrated and comprehensive picture of the NEI's program planning function: how it developed; the approach, rationale, and guiding precepts; who has participated; what the process is; and what has been accomplished to date. This is accompanied by an assessment of the current status of planning at the NEI and recommendations for strengthening the process.

PB82-121799 CP **T11**
Army Support Command, Fort Shafter, HI.
Methods and Standards System.
Software.
28 Jul 79, mag tape FSWEC-80/0146
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-121807.

The methods and standards system consists of four cycles, two as required and two monthly. These cycles edit various transactions, and update the various files with rate, time standards, manpower and organizational data. Monthly, the manhours and production report is produced from these files...Software Description: The system is written in the ANSI COBOL programming language for implementation on an IBM 360/50 computer using the OS/MFT operating system. The computer memory requirement is 100K.

PB82-121807 PC **A04**/MF **A01**
Army Support Command, Fort Shafter, HI.
Methods and Standards System. Computer Operation Manual.
Oct 80, 72p FSWEC-80/0146-1
For system on magnetic tape, see PB82-121799.

The Methods and Standards System consists of four cycles, two as required and two monthly. These cycles edit various transactions, and update the various files with rate, time standards, manpower, and organizational data. Monthly, the manhours and production report is produced from these files. The objective of this operations manual is to provide computer/PCM control and computer operator personnel with a detailed operational description of the system and its associated environment with which they will be concerned during the performance of their duties.

PB82-125907 PC **A05**/MF **A01**
National Governor's Association, Washington, DC.
State-Local Policy Management Project.
Final rept.
Nov 81, 82p
Grant NSF-ISP78-20518
Prepared in cooperation with Dwight Jensen Associates, McLean, VA.

The case studies in this report are the result of a joint project begun nearly three years ago to explore new approaches for increasing state-local coordination in the planning and management of programs in the energy and environmental areas. The purpose of the State-Local Policy Management Project was not new research, but rather to draw valuable lessons from those in policy-making and management positions who have sought -- with varying degrees of success -- to make the intergovernmental system work more effectively. This report should serve to reinforce much of the conventional wisdom about the benefits of sound intergovernmental cooperation. It also contains much information that can be of help to officials who wish to devise better ways of dealing with state-local problems.

PB82-126533 PC **A02**/MF **A01**
Economic Development Administration, Washington, DC. Program Analysis Div.
A Preliminary Examination of EDA Feasibility Studies.
Apr 71, 25p

Feasibility studies constitute a substantial percentage of the projects supported by EDA. They analyze whether a proposed project is capable of implementation, whether it merits the required investment of funds, and they provide a blueprint for implementation of the project in the future. The 101 feasibility studies with positive recommendations were analyzed to determine if follow-up activity occurred and the nature of that activity. The study concludes that feasibility studies with positive recommendations often do not lead to any implementation of the recommendations.

PB82-128604 PC **A16**/MF **A01**
Portland State Univ., OR. Futures Research Inst.
Multiple Perspective Concept with Applications to Technology Assessment and Other Decision Areas.
Final rept.,
H. A. Linstone, A. J. Meltsner, and M. Adelson. Sep 81, 367p 81-1, NSF/PRA-81006
Grant NSF-PRA79-10020
See also PB82-128612.

Research on the use of alternative decision models for technology assessment is presented. The report discusses the generally accepted perspective, its limitations, and earlier work on multiple perspectives including Allison's models and perspectives of Steinbruner and Andersen. Past decisions are considered first in terms of these perspectives and later as an ongoing living system where the investigator is an active participant. A major portion of the report focuses on proposed perspectives for technology assessment and consists of a wide spectrum of illustrations and applications and various stages of development. These include a case study of health care delivery systems, and decisions involving military and corporation technology, electronics funds transfer, the commercialization of guayule, and on-site solid waste treatment. Implications are drawn from these experiences and guidelines are developed for the user. Specific guidelines for implementation of an organizational and personal perspective ffor technology assessment is included in the appendices.

PB82-128612 PC **A05**/MF **A01**
Portland State Univ., OR. Futures Research Inst.
The Multiple Perspective Concept with Applications to Technology Assessment and Other Decision Areas (Condensed Version),
H. A. Linstone, A. J. Meltsner, and M. Adelson. Sep 81, 84p 81-1A, NSF/PRA-81007
Grant NSF-PRA79-10020
See also PB82-128604.

This report is a condensed version of a document on the use of alternative decision models for technology assessment. Presented are (1) the usual perspective and its limitations; (2) multiple perspectives of Allison, Steinbruner, and Andersen; (3) proposed perspctives; (4) illustrations and applications of proposed perspectives and (5) guidelines. The examples span a wide spectrum of uses of multiple perspectives and include military and corporation technology, an electronics funds transfer, guayule commercialization, on-site solid waste treatment, and a case study of a health care delivery system. Guidelines developed for the multiple perspective user involve socio-technological systems in general.

PB82-128620 PC **A12**/MF **A01**
Indiana Univ. Northwest, Gary. Div. of Public and Environmental Affairs.
Technological Innovation and Problem-Solving in Local Government: An Assessment of Current Research Methods.
Final rept.,
Lloyd A. Rowe, and William B. Boise. Jul 81, 273p NSF/PRA-81004
Grant NSF-PRA78-25029
See also PB82-128638. Prepared in cooperation with New York Univ., NY. Graduate School of Public Administration.

The results of a study of local government technological innovation are presented. Several potential external and internal determinants of innovation are presented. The report includes (1) a review of recent studies of local government innovation with conclusions about on-going research needs; (2) an organization-related conceptual framework for the study of local government technological innovation; (3) a description of the methodology used in the study; (4) a report on possible relationships between a varity of organizational policies and processes and the consideration and use of fire technologies in midwest local governments; (5) an analysis of the possible impact of both external and internal influences on the consideration of fire technologies in midwest local governments; (6) a report on the mini-pumper firetruck as a case study of technological innovation; (7) a report on two pilot cities and the local policies and processes which may be associated with innovation; and (8) a discussion of the principal findings of the study and the authors' conclusions on future research and Federal policies concerned with innovation. Questionnaires and related materials are included in the appendices.

PB82-128638 PC **A02**/MF **A01**
Indiana Univ. Northwest, Gary. Div. of Public and Environmental Affairs.
Technological Innovation and Problem-Solving in Local Government: An Assessment of Current Research Methods, Executive Summary.
Final rept.,
Lloyd A. Rowe, and William B. Boise. Jul 81, 24p NSF/PRA-81005
Grant NSF-PRA78-25029
See also PB82-128620. Prepared in cooperation with New York Univ., NY. Graduate School of Public Administration.

This exploratory study of local government technological innovation focuses on several potential local external and internal determinants of innovation. The principal methods used are (1) a review of local government technological innovation studies and other relevant literature for developing a conceptual framework; (2) a questionnaire survey of selected local governments in the Midwest for the purpose of gathering additional data on innovation, testing a hypothesis, and assessing the utility of particular questionnaire items as potential members of internal and organization-related determinants of innovation; and (3) pilot studies in two Midwest local governments in which interviews and questionnaires are used to identify and explore in greater depth the potential and internal determinants of innovation. The municipal service area selected for study are the fire services. Seven fire technologies were examined as potential innovations and the mini-pumper fire truck was chosen as a special focus of the study.

PB82-128828 PC **A03**/MF **A01**
Transportation Research Board, Washington, DC.
Finance Issues: County Highways and Public Transit,
Kumares C. Sinha, Karen L. Pickett, Jean E. Hittle, Alice E. Kidder, and John Collura. 1981, 40p TRB/TRR-813, ISBN-0-309-03254-7
Library of Congress catalog card no. 81-18761. Also pub. as ISSN-0361-1981.

Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC 20418.

The 8 papers in this report deal with the following areas: financing county highways; use of revenue sharing for public transportation in rural areas; examination of regional transit cost allocation among towns: five case studies; minor rural roads: finance trends and issues; principles of highway finance; transit performance measures and local objectives: state-level policy considerations; funding Dade County's transportation improvement program: The Citizens' role; and, partnership funding public transit: Seattle metro.

PB82-132168 PC **A09**/MF **A01**
Arkansas Univ. at Little Rock. Industrial Research and Extension Center.
Industrial Program Grantee Conference. Proceedings of a Conference Held at Hot Springs, Arkansas, May 12-14, 1980,
David E. Douglas. 1980, 184p NSF/RA-800368
Grant NSF-ISP80-14048

Information was exchanged on planned and current research among existing and past Industrial Program grantees, Federal mission agency personnel, industrial representatives, public policy makers, and other interested individuals. Topics included: (1) university/industry coupling; (2) current programs (full experiments) of innovation centers/technology innovation projects; (3) current programs (full experiments) in small business innovation research; (4) current programs (planning experiments); (5) government views of university/industry cooperative research; and (6) lessons learned and opportunities to explore.

PB82-132671 PC **A04**/MF **A01**
National Science Foundation, Washington, DC.
Applied Research Summary of Awards, Fiscal Year 1980.
1980, 71p NSF-80-92, NSF/RA-800620

New awards made in FY 1980 by the Division of Applied Research (DAR) in the Engineering and Applied Science (EAS) Directorate are described. Research in applied social and behavioral sciences include programs concerned with public policy and regulation; public service delivery and urban problems; industrial organizations and markets; and individual and group processes. Research in applied physical, mathematical and biological sciences and engineering include programs in physical, mathematical, and engineering applications; biological and ecological applications; and geophysical and environmental applications. Current 'coherent areas' of DAR consist of research programs on growth, income, and employment; regulation; telecommunications; and production and technology. Other programs involve small business research and research initiation in applied social and behavioral sciences. The presentation format includes the title of the specific grant; the name of the principal investigator; the name and address of the institution conducting the research; the beginning date, amount, and duration of the grant; and a detailed summary of the project.

PB82-133844 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
SBA's Progress in Implementing the Public Law 95-507 Subcontracting and Surety Bond Waiver Provisions Has Been Limited.
Report to the Congress.
18 Sep 81, 36p CED-81-151

GAO recommends changes SBA should make to maximize subcontracting opportunities for small businesses. Also, GAO suggests that the Congress consider extending the bond waiver provision for 2 years and require SBA to report to the Congress on the provision's effectiveness.

PB82-134669 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
Control of Building Engineering Services. Part 1: Background,
G. C. Barney, and V. L. B. de Freitas. Mar 79, 27p
CONTROL SYSTEMS CENTRE-451
See also Part 2, PB82-134677.
Also available in set of 6 reports PC E15, PB82-134651.

This report gives the basic background to the area of Building Engineering Services. First the three main areas of services (environmental, utility and security) are defined. Then the various control systems are examined in detail and lead to generalized control concepts. Finally the problems presented in controlling building engineering services are discussed.

PB82-134677 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
Control of Building Engineering Services. Part 2: A Survey of Proprietary Automation Systems,
G. C. Barney, and V. L. B. de Freitas. Apr 79, 46p
CONTROL SYSTEMS CENTRE-453
See also Part 1, PB82-134669 and Part 3, PB82-134685.
Also available in set of 6 reports PC E15, PB82-134651.

This report surveys current proprietary and private systems as a step towards choosing the most convenient apparatus for research work at UMIST into the control of building engineering services. The report is divided into three main sections. Section 2 reports the historical evolution of building automation systems which led to the present system architectures and current practices. Section 3 reviews current automation systems. Reference is not only made to building automation systems but also to some general process control systems and interfaces used in industrial control systems. Section 4 gives some conclusions which, when combined with those of Part 1 of this report series, provide a basis for the proposed work in the control of building engineering services.

PB82-134685 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
Control of Building Engineering Services. Part 3: A Proposal for a Distributed Data Acquisition and Control (D-DAC) System,
G. C. Barney, and V. L. B. de Freitas. Nov 78, 33p
CONTROL SYSTEMS CENTRE-438
See also Part 2, PB82-134677 and Part 4, PB82-134685.
Also available in set of 6 reports PC E15, PB82-134693.

The advent of the mini digital computer led to Centralized Control Systems which concentrated all information and supervision at a central point. It was soon found, however, that like the dinosaur the signal paths could become extremely long and were vulnerable to failure and breakage. The logical result was to place data and control concentrated locally at important points while still sending data back to a central information center. Thus a distributed or hierarchical data acquisition (measurement) and Control Systems evolved. Nowadays the emergence of the microprocessor has made it possible to conceive of even greater schemes of data acquisition and control and brought new problems. This paper studies the concepts of the topology of a Distributed microcomputer based Data Acquisition and Control (D-DAC) System.

PB82-134693 PC **A02**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
Control of Building Engineering Services. Part 4: Hardware Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
V. L. B. de Freitas, and G. C. Barney. Dec 78, 21p
CONTROL SYSTEMS CENTRE-443
See also Part 3, PB82-134685 and Part 5, PB82-134701.
Also available in set of 6 reports PC E15, PB82-134651.

This report describes in some detail the proposed implementation of the hardware for a Distributed Data Acquisition and Control (D-DAC) system that can be used for multiple building engineering services monitoring and control.

PB82-134701 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
Control of Building Engineering Services. Part 5: Software Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
G. C. Barney, V. L. B. de Freitas, and K. K. Kwan.
Jun 79, 41p CONTROL SYSTEMS CENTRE-456
See also Part 4, PB82-134693 and Part 6, PB82-134719.
Also available in set of 6 reports PC E15, PB82-134651.

The distributed data acquisition and control (D-DAC) system is an integrated hardware-software architecture. The software reflects the distributed concept by replicating at every station the same basic structure based upon a simple supervisor program supervising five main station tasks; communication initialization, application initialization, bus control, communication control and system application interface. This report proposes an implementation and specifies the modules software interfaces and the character-oriented communication protocols. An outline of the software development system shows how a DEC system 10 is on-lined with the D-DAC system.

PB82-134719 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
Control of Building Engineering Services. Part 6: Survey of the Control Systems Centre's Building Engineering Services,
G. C. Barney, and V. L. B. de Freitas. Jan 79, 26p
CONTROL SYSTEMS CENTRE-447
See also Part 5, PB82-134701.
Also available in set of 6 reports PC E15, PB82-134651.

The report contains a survey of the principal building engineering services in the Control Systems Center part of the Chemical Engineering Building. The information given will be used as a basis for decisions regarding the installation of a Distributed Data Acquisition and Control (D-DAC) system.

PB82-134727 PC **A07**/MF **A01**
American Univ., Washington, DC. Inst. for Applied Public Financial Management.
An Evaluation of Farmers Home Administration's Economic Emergency Loan Program Objectives to Determine the Programs Effectiveness and the Need for the Program.
Final rept.,
Roger J. Meredith. Nov 81, 147p 131-80-VIII
Sponsored in part by Farmers Home Administration, Washington, DC.

This project is an evaluation of Farmers Home Administration's (FmHA) economic emergency (EE) loan program. The primary objective was to review the effectiveness and the need for the program. The results of this evaluation indicate that the EE loan program has been accomplishing the objectives for which it was intended by legislation. The implementation of the program by FmHA personnel has been sound and within the authorities established by statutes and agency regulations.

PB82-135369 PC **A05**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Some Planning Theories (Algunos Enfoques de Planeacion),
Jorge Elizondo. Nov 80, 95p 431
Text in Spanish.

Due to the growing number of planning theories it has been considered interesting to review some of them in order to offer together their descriptions. Chapters 1-4 deals with the main planning problems, including planner's role. Chapters 5-16 are concerned with descriptions of the following theories: rational, comprehensive, satisfacing, disjoint incrementalism, mixed scanning, adaptive, innovative, transactional, ideal-purposive, advocacy, participative and radical.

PB82-135419 PC **A06**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Scientific Research and Basic Needs of the People: A Method of Assessing Research Projects (Investigacion Cientifica Y Necesidades Basicas de la Poblacion: Un Metodo de Evaluacion de Proyectos),
Felipe Lara, and Lourdes Aragon. Oct 81, 108p 442
Text in Spanish.

A method is proposed that permits assessing research projects according to their impact upon the satisfaction of basic needs of the marginal population. Two kinds of impacts are considered: direct effects, when the research problem has a straightforward relationship with basic needs, and indirect effects, when the research project helps to develop a specific scientific area that can introduce new solutions to basic needs. The method of evaluation presented here was developed

with the participation of the academic community. To illustrate its usefulness, an example from the social sciences has been considered.

PB82-135856 PC **A05**/MF **A01**
National Bureau of Standards, Washington, DC.
Rationale Statements for Voluntary Standards - Issues, Techniques, and Consequences.
Final rept.,
David A. Swankin. Nov 81, 92p NBS-GCR-81-347

The report provides an overview of the needs, practices and consequences of providing rationale statements for voluntary standards. The research consisted of a literature review, a review of relevant court cases, the collection and assessment of examples of rationale statements, and discussions with those involved in standards writing. Six examples of rationale are analyzed and a discussion of the most controversial issues associated with rationale statements follows. The report also contains a listing of product liability cases in which the issue of standards was raised and analyzes the legal consequences that rationale statements are likely to have on such cases.

PB82-135880 PC **A05**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Consumer Representation in Standards Development: Literature Review and Issue Identification.
Final rept.,
Maureen A. Breitenberg, and Robert G. Atkins. Sep 81, 79p NBSIR-81-2336
Sponsored in part by Food and Drug Administration, Silver Spring, MD. Bureau of Medical Devices.

The report identifies for possible future study the major issues associated with the topic of consumer representation in the development of voluntary standards. The key terms (consumer and consumer representative) used in the report are defined, and background information on the Food and Drug Administration's medical device standards program is given. The report discusses important recent developments in consumer involvement in government and standards organization decisionmaking, and contains a review of Federal public participation programs. The literature on consumer representation is reviewed from the perspective of standards-developing groups and consumer organizations and the most salient documents are annotated. Based upon the available literature, supplemented by information obtained from personal contacts with affected parties, the major outstanding issues are summarized.

PB82-135989 PC **A05**/MF **A01**
JRB Associates, Inc., McLean, VA.
ORD Extramural Program Guide FY 1981,
Richard Laska. Nov 80, 90p EPA-600/9-80-052

The Program Guide provides the public with information on the Office of Research and Development's current extramural research program and serves as a guide to Office of Research and Development's key personnel. This publication is updated each fiscal year.

PB82-137738 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Farm Sector Application of Flow-of-Funds Accounting.
Staff rept.,
Richard W. Simunek. Nov 81, 44p AGES-811110

This paper assesses the impact of existing financial data gaps and specifies future data collection priorities that will substantially improve farm financial analysis. Development of farm sector financial accounting has been hampered by a lack of an understanding of Flow-of-Funds (FOF) objectives at the national level and the intermingling of FOF concepts with National Income and Product (NIPA) accounting concepts at the sector level. In addition, lack of documentation of data sources and data estimation methodologies has blurred the issue of data quality and in turn retarded both the development of improved data collection procedures and farm sector accounts.

PB82-138322 PC **A03**/MF **A01**
International City Management Association, Washington, DC.
Twenty-Five Innovations from Abroad.
1980, 50p NSF/RA-800597
Grant NSF-ISP78-01818

This survey of service delivery improvement ideas from around the world focuses on the dynamics of the transfer process without attempting a technical analysis of the pros and cons of each idea. Where a language barrier or the need for lengthy correspondence with foreign countries is involved, the likelihood of successful transfer diminishes. When someone in the United States is already working with an idea as a licensee, distributor, or colleague, chances for transfer improve dramatically. This handbook describes 25 ideas at a particular stage in the transfer process. The attempt is to ferret out the essential elements and commonalities for the international idea exchange mechanism using specific case histories. For each innovation the following is noted: problem addressed, solution, source, benefits, transfer, and contact. Topics covered include cost savings, energy, handicapped and elderly service delivery, housing, information exchange, traffic management/transportation, urban aesthetics/environment, and waste management.

PB82-144528 PC **A02**/MF **A01**
Coalition of Northeast Municipalities, Boston, MA.
Forecasting Municipal Revenues and Expenditures: A Primer and Handbook,
Roy Bahl, and William Montrone. Jan 80, 23p HUD-0002061
Contract HUD-H-4434
Prepared in cooperation with Maxwell School of Citizenship and Public Affairs, Syracuse, NY. Metropolitan Studies Program. Sponsored in part by National Science Foundation, Washington, DC.

This handbook is designed to assist Northeast municipal governments with fiscal planning, specifically, forecasting municipal revenues and expenditures. The handbook's first part provides extensive background on forecasting and includes sections on the purposes and uses of fiscal forecasting, forecasting practices, and the administrative framework for forecasting. The second part describes a simple forecasting model which can be used locally without expensive equipment or prohibitively large staff assignments. Forecasting is used mainly for annual budget preparation to determine where a gap may exist between revenues and expenditures and to assess the impact of a policy or exogenous change in the budgetary situation. Methods used in forecasting are of four types: best guess or expert judgment, trend techniques, deterministic forecasts, and statistical forecasts. The handbook notes that it is advantageous to locate the organizational responsibility for preparing the forecast in the budget or finance department. The forecasting model uses a public employment approach, with aggregate spending forecasts following from assumptions about the level of governmental employees which a municipality will use and the prices paid for these services. A process is also offered for predicting future levels of intergovernmental aid. Figures and worksheets are included. (Author abstract modified).

PB82-144536 PC **A02**/MF **A01**
Coalition of Northeast Municipalities, Boston, MA.
Let's Make a Deal or On the Way to Public - Private Partnerships,
Nicholas P. Retsinas. Sep 80, 22p HUD-0002062
Contract HUD-H-4435

Geared to mayors and managers, this handbook is designed to assist these officials when they negotiate with the private sector to implement economic development activities. The guide outlines situations and tactics which give an overview of the context of economic development. An economic analysis of a community is the first step in devising an economic development strategy. Local officials should focus on identifying those factors which can make their community attractive to the type of private sector investments that best address their econnomic goals. A clear understanding of the economic base should suggest specific economic development objectives (e.g., an enhanced tax base or job creation), to be ranked according to importance. Thus, when officials negotiate with the private sector they will be able to determine which of these objectives a particular project will achieve. Tools available to local government to attract the desired private sector involvement are zoning and permits, location of public facilities, tax incentives, public procurement, and bonding (tax increment financing). Techniques to help a city initiate a partnership with the private sector include open solicitation (marketing) to restricted contracts. The negotiation process itself is discussed, giving suggestions for using the negotiating team, setting the tone, and preparing for compromise. Once a project is agreed upon, staff followup and monitoring are essential. A bibliography contains 11 references and an appendix lists municipal economic development resources.

PB82-144585 PC **A05**/MF **A01**
Municipal Finance Officers Association of United States and Canada, Washington, DC. Government Finance Research Center.
New Initiatives in Financial Management Capacity Sharing: The Municipal Finance Officers' Perspective.
Feb 81, 86p HUD-0002067
Grant HUD-H-5390SG

This report describes the activities of the Government Finance Research Center (GFRC) of the Municipal Finance Officers Association as it reassessed and updated information on the financial management improvement needs of finance officers from around the Nation. This reassessment was undertaken for HUD's Government Capacity Building Division. The project was begun in December 1980 and concluded with HUD's National Priority - Setting Conference in Washington, D.C. in February 1981. The GFRC's project included conducting two needs assessment workshops with elected and appointed finance officials representing jurisdictions on all sizes from around the Nation. The workshops and other activities resulted in problem statements in several areas, including three identified by HUD: information needs in negotiating with the private sector; planning, managing, and maintaining capital infrastructure; and managing energy consumption and supply at the local level. Workshop participants noted that many of these problems are caused by financial problems such as an inability to enter the bond market or lack of knowledge of alternative financing sources. The needs for better training for all employees and elected officials and for better communication with taxpayers and the media were noted. Other needs are the creation of a talent bank which local governments could tap and information systems for such purposes as monitoring energy consumption and knowing the status of a jurisdiction's capital infrastructure. Detailed statements of each identified problem are provided, and include information on symptoms, level of importance, range of local situations prone to the problem, causes, responsibility, constraints, potential solutions, existing sources of assistance, and programmatic responses. Appendices provide a list of workshop participants, a bibliography, and the format for problem statements.

PB82-144700 PC **A03**/MF **A01**
Consortium for Public Administration Field Services, Pittsburgh, PA.
Consortium for Public Administration Field Services: The First Two Years.
Nov 80, 45p HUD-0002086
Contract HUD-H-2693

The Consortium of Public Administration Field Services was formed by three universities to demonstrate that their graduate schools could provide practical assistance to groups of local governments or to individual units to enable them to increase their management capacity. The first 2 years of activity for the consortium are reported on. The consortium was created by the graduate schools of public administration and affairs of the University of Pittsburgh, West Virginia University, and Carnegie - Mellon University early in 1978. Teams of faculty and students provided management assistance to over 50 small, diverse communities in southwestern Pennsylvania, northern West Virginia, and southeastern Ohio. Small government units in these areas are experiencing severe pressures because the outmigration of industry and population has coincided with demands for new services and for the more efficient use of decliing resources. The consortium's demonstration program included direct assistance to communities and dissemination of results of individual assistance projects to other communities in the region and to other regions and schools of public administration and affairs. Projects have included improving cash management systems, developing an inexpensive approach to codifying ordinances, initiating risk management programs, and placing student interns in local governments to demonstrate the benefits of professional managers. The program has helped communities meet their management needs, has provided practical research and internship opportunities for faculty and students, and has initiated interest in undertaking similar projects in other communities and schools. Consortium project activities are planned for 2 more

years. Descriptions of the project's background, organization, operating process, and results of 33 finished projects are provided, along with a map and list of project locations and participants.

PB82-144924 PC **A03**/MF **A01**
National Training and Development Service for State and Local Government, Washington, DC.
Training in Local Government Financial Management Practices. A Supplement to Volume V Trainer's Resource Service (TRS) Catalog of Resources.
Dec 80, 45p HUD-0002110
Grant HUD-H-5162RG

This manual lists training programs and materials on local government financial management practices and provides an update to 'Training in Local Government Financial Management Practices,' which included annotations of over 200 information sources on this topic. The supplement should be a useful reference for elected and appointed officials, financial managers, and technical assistance providers. The manual covers accounting, auditing, and financial reporting; computer applications; financial management; purchasing; revenue and expenditure forecasting; risk management; and tax assessment. Within each category, descriptions of training resources appear in alphabetical order by sponsoring organization. Each item listed includes the sponsoring organization's address and telephone number, the name of the resource, type of resource (workshop, seminar, handbook, manual, curriculum package, or self - study course), length of program, and a brief summary. Summaries include the following information whenever possible: objectives of the program, content covered, target audience, and unique features. Resources that address issues of more than one category are cross - referenced in other categories. (Author abstract modified).

PB82-144957 PC **A05**/MF **A01**
Maxwell School of Citizenship and Public Affairs, Syracuse, NY. Metropolitan Studies Program.
Grantee Budgeting for Federal and State Aid, Part 1: General Findings and Policy Options,
Jesse Burkhead. May 81, 90p HUD-0002115
Grant HUD-H-5140RG

This report presents the findings and policy options of a study of local government's grantee budgeting for Federal and State aid and maintains that emphasis on improved budget classification would result in better budget policy. Two study approaches were used examinations of budgeting, financial management organization, and financial reporting in New York and Pennsylvania and in two counties and cities of each of these States; and extensive interviews in each of the jurisdictions. The study found that very great changes have occurred in the U.S. intergovernmental system over the last 25 years with budgetary fragmentation being the result. Both State and local jurisdiction grants are frequently off - budget (not included in the closed accounts or revenue estimates for the budget year), and jurisdictions' budget and financial accounts are becoming increasingly nonuniform. These factors impair the credibility of the budget as a document and interfere with legislative review. Several policy options could help correct the situation. These include local government use of additional Federal assistance through the extension of HUD's Financial Management Capacity Sharing Program (FMCSP), the expansion of the Intergovernmental Personnel Act of 1970, and mandated improvements in budget classification for grants - in - aid. Other options are the development of uniform State accounting standards and the use of resource organizations such as the National Governor's Conference and the National Association of State Budget Officers. Footnotes and nine tables are given.

PB82-144965 PC **A06**/MF **A01**
Maxwell School of Citizenship and Public Affairs, Syracuse, NY. Metropolitan Studies Program.
Grantee Budgeting for Federal and State Aid, Part 2: Jurisdictional Practices,
Jesse Burkhead. May 81, 124p HUD-0002116
Contract HUD-H-5140RG

This report examines budget and financial management organization and grantee budget and financial reporting in New York and Pennsylvania and in two counties and two cities in each of these States. The narratives that compose this report reflect an examination of budgets, budget manuals, constitutions, statutes, municipal charters, and a variety of financial reports. New York State's government is both centralized and decentralized in organization for grantsmanship, has centralized control over capital projects that involve Federal assistance, and has a budget that includes both summary and department and agency classifications that reflect Federal funding. Pennsylvania has moved toward a stronger executive budget system in recent years, has State government with a decentralized grantsmanship pattern, and has very little State supervision of the budgeting and financial management responsibilities of municipalities. Narratives are also provided for the New York counties of Onondaga and Monroe and for the cities of Syracuse and Rochester as well as for the Pennsylvania counties of Lehigh and Dauphin and the cities of Allentown and Harrisburg. Figures, footnotes, and tabular data are included.

PB82-144973 PC **A06**/MF **A01**
Joint Center for Political Studies, Washington, DC.
Management Improvement Needs of Disadvantaged Communities.
19 May 81, 120p HUD-0002117
Grant HUD-H-5389SG

This report describes the Joint Center for Political Studies' objectives, products, and overall role in reassessing and updating the management improvement needs of local government officials. In 1978, the Financial Management Capacity Sharing Program (FMCSP) of HUD's Office of Policy Development and Research adopted a process of listening to local officials' analyses of their management problems and needs and of responding with the kinds of assistance these officials said would help them. The resulting program has brought HUD, hundreds of local governments, and organizations that assist them into networks that cooperate by sharing information through workshops, regional conferences, a resource center, intra - State networks, peer match assistance, publications, and other efforts. These activities were a first response to a needs assessment in which more than 1,000 officials worked together to define the priority financial management needs of local governments. In November 1980, HUD's FMCSP staff asked local officials to reassess their management improvement needs and, in particular, to say if there were priority problems to be addressed in three areas that had been most frequently mentioned in these conversations: (1) information needs in negotiating with the private sector; (2) planning, managing, and maintaining capital infrastructure; and (3) managing energy consumption and supply at the local level. Seven organizations serving local governments sponsored workshops and other activities that identified problems in these three areas and others. The report contains 2 tables and 13 exhibits, along with a survey form and survey results. (Author abstract modified).

PB82-144981 PC **A04**/MF **A01**
International City Management Association, Washington, DC.
Management Improvement Needs of Local Manager Governments: A Final Report.
Jun 81, 69p HUD-0002118
Grant HUD-H-5386SG

This report describes the activities of the International City Management Association (ICMA) in assessing and updating the financial management needs of local government officials. To carry out the needs assessment, ICMA assembled resource materials on three previously identified problem areas (negotiating with the private sector, managing capital infrastructure, and managing energy needs). ICMA also conducted two workshop sessions, solicited comments from a sample of ICMA members, reviewed the results of a previously conducted ICMA energy management survey, and developed a problem statement for each of the areas. A total of 91 city managers and assistants participated, while an additional 36 local officials were surveyed in a prior energy management needs assessment. The needs assessment findings revealed that the capital infrastructure issue was of the highest priority, while managing energy needs and negotiating with the private sector were of equal importance, but not as important as the infrastructure issue. Energy issues identified as important included the inability to identify and prioritize energy problems, the conflicting information about what can or should be done in energy management by local governments, and the difficulty in determining the allocation of financial resources for energy management. In addition, participants said they lacked understanding about how business decisions are made and what the community can and should do on behalf of existing or prospective business. Workshops, small group seminars, and 'peer - matches' were suggested as effective capacity sharing techniques. Footnotes and appendices, including an annotated bibliography of seven references, are supplied. (Author abstract modified).

PB82-802489 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Management Games. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 378p
Supersedes PB80-813850, and NTIS/PS-79/0942.

The citations present studies on the applications of game theory to the management process. Aids for management in education, military planning, economics, city planning, library systems, water resources, nuclear material accounting, and other gaming models are included. (This updated bibliography contains 380 citations, 32 of which are new entries to the previous edition.)

5B. Documentation and Information Technology

AD-A106 851/9 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Accounting and Financial Management Div.
Data on Small Business--Much is Collected but it Should be Integrated for Better Use.
16 Jul 81, 11p Rept no. GAO/AFMD-81-71

Virtually all officials we met with at Federal data gathering agencies and the Small Business Administration recognized the need for a small business data base. In our opinion, data gathering, analysis, and dissemination is a valid and important role for the Federal Government. Unquestionably, a wealth of information exists and is routinely gathered, but is not fully used due to legal and technical problems. The issues of confidentiality and access are being addressed through pending legislative proposals. We believe legislation will be needed to make federally collected data on small businesses more useful for policy analysis while ensuring confidentiality. The technical problems associated with coverage, comparability, errors, and timing are well recognized among the data gathering agencies, SBA, the Office of Federal Statistical Policy and Standards, and OMB. While many of the problems can be overcome, agencies are constrained by limited resources. (Author)

AD-A106 866/7 PC **A03**/MF **A01**
University of Southern California, Los Angeles. Center for Effective Organizations.
Systems Are Not Solutions: Issues in Creating Information Systems That Account for the Human Organization.
Interim rept.,
Philip H. Mirvis, and Edward E. Lawler, III . Jun 81, 39p 81-6(12), 2, AD-E001 184
Contracts N00014-81-K-0048, N00014-78-C-0609
Prepared in cooperation with Boston Univ., MA. Center for Applied Social Science.

The results of two action research projects are reported. Both focus on changing the information systems in organizations. One involved public reporting of measure, the other use of measures for feedback purposes within the organization. In neither case did the changes in the information systems have the expected results. The implications of this for changes in organizations are considered and the point is made that systems are not solutions although sometimes they can aid in finding them.

AD-A107 079/6 PC **A06**/MF **A01**
Calculon Corp., Rockville, MD.
Records Filing, Maintenance and Disposition Study for Department of the Army.
Final rept. 1 Oct 80-30 Sep 81,
John R. Maher. 30 Sep 81, 104p
Contract MDA903-80-C-0721
Includes a Literature Search dated 17 Apr 81.

This report is in Staff Study format with a short management summary preceding the main study. The body of the study covers only the main points and ideas. Development is contained in tabbed appendices. The Army Functional File System (TAFFS) is institutionalized in Army Regulations 340-1 and 340-18-1 thru 340-18-16. It was developed in the later 1950's; implemented in 1963; and received major refinement in 1969. It replaced a subject file system with functional system which included a comprehensive disposition system. The development of office technology eroded the usefulness of TAFFS although a manual file system must be the mainstay of the Army of years to come. The Study infers that TAFFS should be replaced because it (1) does not lend itself to automation; (2) possesses major flaws in its management support characteristics; and (3) is not a good wartime system. Army Records Management Officials do not fully agree with this assessment. The Contractor suggests that in replacing TAFFS the Army should position itself to adopt such state-of-the-art developments as it finds useful and cost effective and install a simpler more management oriented manual system for immediate interim use. To accomplish this, Calculon maintains that a first order of business is to develop a simpler information classification system. A subjective or functional subjective system which eliminated the complexity of TAFFS is advisable. The Contractor recommends testing over 18 months two groups of subsystems and concepts. One is a conservative test based on a simplified TAFFS; and, the other is innovative, based on a long standing Army subjective classification system used to classify and number Army regulations.

AD-A107 192/7 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Veterans Administration's Efforts to Improve the Management of Paper Records in the Department of Veterans Benefits. A Major System Acquisition Project.
30 Jun 81, 9p Rept no. GAO/HRD-81-106

This effort is DVB's Micrographics and Automated Retrieval Systems (MARS) project, which is being conducted as a major system acquisition pursuant to the Office of Management and Budget (OMB) Circular A-109--a uniform, executive branch procurement policy. DVB's MARS project, estimated in 1980 to cost $26 million over 8 years, has not progressed sufficiently to permit a complete assessment. Further, there is considerable doubt regarding the future of the project because of fiscal year 1982 budget cuts. DVB's current efforts are to convert only loan guaranty files to micrographics. Loan guaranty files are a small portion (3.2 million files) of DVB's total active record holdings (19.2 million files). DVB does not intend to study the need to convert its remaining record holdings until micrographic centers have been established for the loan guaranty files.

DE81000502 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Preliminary Internal Data Screening - a Component of Quantitative Data Analysis in Data Validation.
D. J. Pack. Sep 81, 35p ORNL/CSD-85
Contract W-7405-ENG-26

Internal data screening is validation of data by quantitative internal comparisons across records for a given variable, across variables for a given record, across time for a given variable and record, etc. Preliminary internal data screening has the objectives of producing 1) a frozen, archived data base ready for efficient computer analysis and 2) a general understanding of key variables, a rough cut at response meaningfulness, a qualification of the type of error present, and an assessment of the expected level of difficulty in the comprehensive validation. The relatively less important first objective is defined. It is seen to be achievable through simple computer methodology. The second objective is the paper's major focus. Initial methodological suggestions for accomplishing this objective centering upon the exploratory data analysis techniques of Tukey are made, recognizing these techniques appropriateness for a general examination of a large data base that may contain numerous errors. (ERA citation 06:035776)

LBL-10648 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Efficient Access of Compressed Data.
S. J. Eggers, and A. Shoshani. Jun 80, 22p CONF-801009-2
Contract W-7405-ENG-48
International conference on very large data bases, Montreal, Canada, 1 Oct 1980.

A compression technique is presented that allows a high degree of compression but requires only logarithmic access time. The technique is a constant suppression scheme, and is most applicable to stable databases whose distribution of constants is fairly clustered. Furthermore, the repeated use of the technique permits the suppression of a multiple number of different constants. Of particular interest is the application of the constant suppression technique to databases the composite key of which is made up of an incomplete cross product of several attribute domains. The scheme for compressing the full cross product composite key is well known. This paper, however, also handles the general, incomplete case by applying the constant suppression technique in conjunction with a composite key suppression scheme. (ERA citation 05:034459)

N82-11981/9 PC **E03**
National Aeronautics and Space Administration, Washington, DC.
Nasa Patent Abstracts Bibliography: A Continuing Bibliography, Section 1, Abstracts. Supplement 19.
Jul 81, 53p NASA-SP-7039(19)-SEC-1

Abstracts are cited for 130 patents and patent applications introduced into the NASA scientific and technical information system during the period of January 1981 through July 1981. Each entry consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or application for patent.

N82-11982/7 PC **E05**
National Aeronautics and Space Administration, Washington, DC.
Nasa Patent Abstracts Bibliography: A Continuing Bibliography, Section 2, Indexes. Supplement 19.
Jul 81, 684p NASA-SP-7039(19)-SEC-2

Citations of approximately 4,000 patents and patent applications for the period May 1969 through July 1981 are indexed according to subject, invention, source, number, and accession number.

PB81-928110 PC **E13**/MF **A01**
Central Intelligence Agency, Washington, DC.
Directory of Soviet Officials: Republic Organizations.
Oct 81, 475p CR-81-11359
Supersedes PB80-928114.
Paper copy also available on Standing Order, Deposit Account required. North American Continent price based on page count of individual documents; all others write for quote. This series offers a reduction in price as a Standing Order, PB81-928100.

The Directory of Soviet Officials: Republic Organizations identifies people who hold high-level positions in selected party, government and public organizations in the Soviet Union's constituent republics. It combines and supersedes the volumes last published as Directory of Soviet Officials, Volume II: RSFSR Organizations (CR 80-13212, July 1980) and Volume III: Union Republics (CR 79-11484, March 1979).

PB82-121815 CP **T05**
Bureau of Radiological Health, Rockville, MD. Data Systems and Mathematics Staff.
File Analysis and Selection Technique (FAST).
Software,
Wayne Heiden. 22 Mar 76, mag tape FSWEC-77/0109
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

The program allows user to easily retrieve selected portions of information from a data file, and to print the information in some meaningful format, or make it available for further processing. Data files are accessed by the coding of a simple set of parameter cards. The program allows sorting of output before printing, selecting of fields within a record before output, printing of heading information, and several print spacing options...Software Description: The program is written in the IBM Assembly language for implementation on an IBM 370/168 computer using the VS2, rel. 1.7, operating system. The computer memory requirement is 100K bytes.

PB82-121823 PC **A09**/MF **A01**
Bureau of Radiological Health, Rockville, MD. Data Systems and Mathematics Staff.
File Analysis and Selection Technique (FAST). Users Manual.
Mar 76, 177p FSWEC-77/0109-1
For system on magnetic tape, see PB81-121815.Portions of this document are not fully legible.

The File Analysis and Selection Technique allows the user to easily retrieve selected portions of information from a data file, and to print the information in some meaningful format, or make it available for further processing. Data files are accessed by the coding of a simple set of parameter cards. Program allows sorting of output before printing, selecting of fields within a record before output, printing of heading information, and several print spacing options.

PB82-121831 CP **T03**
Army Forces Command, Fort McPherson, GA.
Label Utility System.
Software.
28 Jul 75, mag tape FSWEC-80/0109
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-121849.

Input may be accepted from cards, tape, or disc. A control card gives parameters of input fields to be used. These are formatted by the program into desired label format that may print three labels across and up to 99 labels per record...Software Description: The program is written in the COBOL programming language for implementation on an IBM 360/50 computer using the OS operating system. The computer memory requirement is 20K.

PB82-121849 PC **A05**/MF **A01**
Army Forces Command, Fort McPherson, GA.
Label Utility System.
Jul 75, 80p FSWEC-80/0109-1
For system on magnetic tape, see PB82-121831.

The Label Utility System accepts input from cards, tape, or disk. A control card gives parameters of input fields to be used. These are formatted by the program into desired label format that may print three labels across and up to 99 labels per record.

PB82-121898 CP **T05**
Bureau of Radiological Health, Rockville, MD. Data Systems and Mathematics Staff.
DSMS Update System.
Software,
Wayne Heiden. 20 Jan 76, mag tape FSWEC-77/0004
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-121906.

System allows user to update a data file by adding to, deleting from, or changing, data previously stored on a magnetic disc or tape...Software Description: The program is written in the IBM Assembly language for implementation on an IBM 370/168 computer using the VS2, rel. 1.7, operating system. The computer memory requirement is 30K bytes.

PB82-121906 PC **A02**/MF **A01**
Bureau of Radiological Health, Rockville, MD. Data Systems and Mathematics Staff.
DSMS Update System, User's Guide.
Jan 76, 19p FSWEC-77/0004-1
For system on magnetic tape, see PB82-121898.

This program is designed to update files by adding, deleting, or changing records. In addition, records can be sequence-numbered and records can be selected from the master file to create another file. The program is written in the System/360 Assembly Language (ALC) using Logical IOCS.

PB82-131921 PC **A02**/MF **A01**
National Science Foundation, Washington, DC.
Recent Awards: October-December 1978.
Dec 78, 16p NSF/RA-780913

Each of the following problem areas of the Division of Problem-Focused Research Applications (PFRA) is described: alternative biological sources of materials; chemical threats to man and the environment; community water management; and earthquake hazards mitigation. The presentation format includes the title of the specific grant, the name and mailing address of the principal investigator, the institution conducting the research, the award number, and a detailed summery of the project. Persons wishing to obtain information on project findings, including project reports, monographs, journal articles, technical reports, and other relevant materials should write to the principal investigator at the grantee institution to determine what information is available and at what cost, if any, it may be obtained. New programs to be initiated by PFRA in FY 1979 are Science and Technology to Aid the Physically Handicapped and Human Nutrition.

PB82-132648 PC **A02**/MF **A01**
University of Strathclyde, Glasgow (Scotland).
The Information User in the Construction Industry - A Study of the Educational Need and Provision,
Michael Munday. Aug 81, 25p
Also pub. as Conseil International du Batiment pour la Recherche l'Etude et la Documentation, Rotterdam (Netherlands) CIB Working Commission Paper W 57/73/81/09/24. Presented at the Annual General Assembly of CIB Working Commission W 57 (7th), 'Building Documentation and Information Transfer' held at Vienna, Austria on 23-25 September 1981.

There is as yet very little measured and costed evidence of the practical benefits that would accrue to an Industry in which users had a high level of understanding and ability in information management and in which the support role of 'Information Manager' was acknowledged. There is, however, ample record that information handling occupies a high percentage of production time, and that authoritative views put poor performance in this field at the root of many of the Industry's problems. Such problems fall into two main categories. The first relates to buildings themselves and concerns physical (collapse, fire, leaks, condensation etc.) and spatial (short life, tight fit, high energy, etc.) failure. The second category concerns organizational failures. Clearly improvements in both these categories could be beneficial. Excessive waste, high costs, abnormal time, needless repetition and debilitating litigation could well be reduced and inter-user relationships, at both the personal and organizational levels, strengthened. They could also mean something more than a higher level of efficiency and a reduction in costs; improved standards in the quality of design and construction, and greater job satisfaction could also result. These claims are often judged extravagant, yet the underlying cause is rarely disputed. Users are generally conditioned to regard information as being nonproductive, simply a means to an end, and stereotyped attitudes are often set up, becoming barriers to improvement. Improvements in the management of information using better procedures, relevant aids and improved human performance may well result in changes in organizational structures but the users involved in these new patterns and relationships and in the procedures which accompany them will still need to know how to manage information and have the ability to do so. Similarly developments in the role of Information Managers are likely only to happen when the user population has a better understanding of information problem. Information-based problems will lessen only if the skills and understanding are there and used.

PB82-132846 PC **A06**/MF **A01**
National Science Foundation, Washington, DC.
Recent Research Reports, Entries 1320-1540: Bibliography.
1981, 120p NSF-81-68, NSF/PRM-81001
See also Entries 1175-1317, PB81-174575.

This report contains 220 abstracts of recent technical reports, journal articles, and other documents resulting from research programs supported by the National Science Foundation (NSF). The primary purpose of this directory is to apprise the scientific and technical community of current research in the following areas: environmental biology; information science and technology; physiology, cellular, and molecular biology; social and economic sciences; chemical and process engineering; civil and environmental engineering; electrical, computer, and systems engineering; mechanical engineering and applied mechanics; industrial science and technological innovation; policy research and analysis; intergovernmental and public service science and technology; and international programs. Each citation includes the NSF report number, entry number, title, performing organization, author, award number, publication date, pagination, availability information, and an abstract. The NSF was reorganized to broaden the agency's capacity to support basic and applied research in the sciences and engineering and to give new emphasis to engineering research. The new organization to the division level is depicted in the appendix. Included in the directory is an entry index to previous issues; indices for report and grant numbers; and an author, subject, and performing organization index.

PB82-133133 PC **A16**/MF **A01**
Lesotho Agricultural Sector Analysis Project, Maseru.
Catalog of Holdings and Other References in the Lesotho MOA/LASA Library.
Research rept.,
Gene C. Wilken, Matsaba J. Leballo, Betty J. Eckert, and Makhothatsa Motleleng. Feb 80, 375p LASA/RR-5, AID-PN-AAH-529
Prepared in cooperation with Colorado State Univ., Fort Collins. Dept. of Economics.

In 1978 the Lesotho Agricultural Sector Analysis (LASA) project team compiled a bibliography listing reference materials on agricultural planning and development in Lesotho which were held in collections in the United States, Europe and Africa. Since that time, the acquisition efforts of the LASA project team have focused on obtaining materials from Lesotho, such as national and ministerial documents and technical and statistical reports, as well as project papers, data analyses, and related consultant reports reflecting indigenous research and development activities. This second bibliography represents the collection of the LASA library, which has recently merged with that of Lesotho's Ministry of Agriculture. This combined collection contains the most complete and accessible agricultural and development planning materials and project documents in Lesotho. The bibliography contains nearly 3,000 entries (1841-1979) of English, Italian, Sesuto, German, French, and Spanish publications, and is organized into the following subject categories: georgraphy and natural resources; agriculture; agricultural marketing; industry and commerce; population, employment, and migration; education, training, and extension; health and nutrition; society, culture, and the political process; Lesotho planning and development assistance; and theory and methodology.

PB82-134073 PC **A04**/MF **A01**
Little (Arthur D.), Inc., Cambridge, MA.
Methods for Evaluating Costs of Automated Hospital Information Systems.
Research summary series,
Erica Drazen, and Jane Metzger. Jul 81, 56p
NCHSR-81-171, DHHS/PUB/PHS-81-3283
Contract PHS-233-79-3000
See also PB80-178593.

Sponsored by the National Center for Health Services Research, this study was conducted to critique methodologies for assessing the cost impacts of automated hospital information systems (AHIS). Research done in these studies to the identification, prediction or measurement, and analytical treatment of specific cost impacts are compared and their adequacy and validity assessed. Conclusions are drawn about the current state of the art of assessing AHIS cost impacts. Recommendations are made concerning the best available techniques. Further research is also recommended in the improvement of specific cost assessment methods and in the development of better information on the influence of automated information handling on hospital costs.

PB82-134529 PC **A05**/MF **A01**
Council on Library Resources, Inc., Washington, DC.
The Subject Access Problem - Opportunities for Solution: A Workshop Held at Springfield, Virginia on 18-20 October, 1978.
Final rept. 16 Sep 77-31 Mar 79.
6 Sep 79, 84p
Grants NSF-DSI75-14876, NSF-DSI77-19588

The need to improve the ability of the user to find needed information through subject access was the basis for the workshop. The Committee organized the workshop to: (1) highlight the role of subject access with the emphasis on the needs of the information seeker, (2) compare techniques for subject access now being used in the library and abstracting and indexing (A&I) communities including applicable research efforts, (3) emphasize the role and nature of authority files in subject access control and facilitation, (4) seek opportunities to (a) improve information preparation for subject access through better functional interconnection and integration across all communities and (b) promote the use and enhance techniques for subject to classes of publications not now adequately covered.

PB82-134537 PC **A03**/MF **A01**
Scientific Analysis Corp., San Francisco, CA.
The Prevalence of Rape and Sexual Assault.
Final rept.,
Diana E. H. Russell. Aug 79, 45p NIMH-81-46
Grant PHS-R01-MH-28960

The prevalence of rape and sexual assault among adult women was estimated by interviewing 932 San Francisco women. Reliable rates of prevalence and incidence were not obtained due to the difficulty in obtaining a true random sample. The database is of considerable interest and represents a body of data on rare events where there is no other reliable material.

PB82-135781 PC **A02**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Trial of a Computer Generated Travel Information System in Two British Rail Travel Enquiry Bureaux,
M. W. Pickett, and G. Daniels. c1981, 24p TRRL-SUPPLEMENTARY-685
Also pub. as ISSN-0305-1315.

The report describes a trial system developed to answer complex travel inquiries. The system, computer-based, produced information on cross-country travel and included fares. Travel staff saved time and improved the quality of their replies to the public.

PB82-136227 PC **E02**/MF **E02**
Radcliffe Science Library (England).
A Reappraisal of the Use of IDMS for the Radcliffe Science Library Serials Handling System,
A. P. Jagodzinski. Mar 80, 8p RSL/ENG-673/5

The report reassesses the potential use of the IDMS system for serials handling at the Radcliffe Science Library. This data base management system was rejected in favor of a simpler data structure based on indexed-sequential files.

PB82-137753 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Program Analysis Div.
A Systematic Management Approach Is Needed for Congressional Reporting Requirements.
Report to the Congress.
25 Nov 81, 57p PAD-82-12

The Congress levies reporting requirements on Federal agencies and others to obtain information on Government programs and activities. In fiscal year 1980, 2,680 reporting requirements produced approximately 4,000 reports at a reported cost exceeding $80 million. These reporting requirements are not being managed in a way that achieves the objectives for which they were created. They are managed by several organizations acting independently of each other with little or no coordination among them. As a result, performance of tasks overlaps and functional and informational gaps exist.

PB82-138157 PC **A06**/MF **A01**
National Science Council of Sri Lanka, Colombo.
Bibliography of Scientific Literature Relating to Sri Lanka: First Supplement,
N. A. W. A. T. Alwis. 1979, 116p
See also PB82-138165.

The report is the first supplement to a Bibliography of Scientific publications relating to Sri Lanka from 1960-1977. It includes 774 reports. Topics include: Geology, chemistry, physics, mathematics, and biology.

PB82-144379 PC **A04**/MF **A01**
Systems Management Associates, Inc., Virginia Beach, VA.
Methodology for Collecting Data.
19 Aug 80, 56p HUD-0001707
Contract HUD-H-5115

This methodology report for HUD provides a project overview, reference document research methodology, results of a document search, interviewing methodology, and organization of data. The project is designed to

obtain and organize information on all sources of data concerning the physical characteristics of housing found in HUD and FTC and to create a data base management system. The primary sources of data are narrative and standardized forms and project summaries developed by HUD, the Federal Trade Commission (FTC), and their contractors for research and operational purposes. The report's research methodology section covers the collection of documents, the HUD USER database, forms, identification of prime interviewees; a list of HUD Policy and Development contracts and interviewees; and a list of FTC systems and interviewees. and the analysis of documents (phases I, II, and III). In addition, the results of the document search are outlined, including a list of sources; references; a list of programs and interviewees; a list of program evaluations and interviewees. The interviewing methodology contains an introductory letter and a questionnaire, and two appendices list external sources and forms.

5C. Economics

AD-A106 856/8 PC **A11**/MF **A01**
General Accounting Office, Washington, DC. Program Analysis Div.
Billions of Dollars are Involved in Taxation of the Life Insurance Industry -- Some Corrections in the Law are Needed.
17 Sep 81, 236p Rept no. GAO/PAD-81-1
Report to the Congress.

This report examines the provisions of the Internal Revenue Code under which life insurance companies are taxed. We made this review to determine whether the provisions, which were enacted in 1959 and have not been reviewed since, were in need of revision in the light of changed conditions in the economy and the life insurance industry. (Author)

AD-A106 869/1 PC **A07**/MF **A01**
Institute for Defense Analyses, Arlington, VA. Science and Technology Div.
Software Technology Transfer and Export Control.
Rept. for Dec 79-Oct 80,
Seymour E. Goodman, Norman S. Glick, William K. McHenry, John B. McLean, and Claude E. Walston. Jan 81, 142p IDA-N-878, IDA/HQ-81-23408, AD-E500 419
Contract MDA903-79-C-0018

The formulation of a reasonable and effective export control policy for software products and software engineering know-how has been an important and difficult task for both the U.S. Government and industry. This note represents the contribution of the Software Subgroup of Technical Working Group 7 (Computers) to the development of a technical policy for the control of software. The note attempts to provide useful discussions and analysis in three areas. The first examines why the problem of software control has been so difficult, and presents the rationale for a number of working hypotheses which underlie the approach taken for the entire study. The second examines, in some detail, the 'what' (know-how and operational capability) and 'how' (transfer mechanisms) of software technology transfer. The last section recommends several items for inclusion on the Militarily Critical Technologies List.

AD-A106 878/2 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. International Div.
U.S. Laws and Regulations Applicable to Imports from Nonmarket Economies Could be Improved.
3 Sep 81, 98p Rept no. GAO/ID-81-35
Report to the Congress.

For political and economic reasons, the United States trades with countries whose economic systems, unlike ours, are under centralized government control. Because of these differences, U.S. laws designed to protect domestic industry from unfair or disruptive imports are difficult to apply to these nonmarket, principally Communist, countries. This report discusses how these laws and their implementing regulations could be improved to make them more effective and easier to administer while protecting domestic industries.

AD-A106 881/6 PC **A09**/MF **A01**
General Accounting Office, Washington, DC. International Div.
Industry Views on the Ability of the U.S. Photovoltaics Industry to Compete in Foreign Markets.
15 Sep 81, 181p Rept no. GAO/ID-81-63

This report is in response to your letter of June 3, 1981, requesting information on the effects of proposed budget changes on the competitiveness of the U.S. photovoltaics industry in the world market. That information, contained herein, was obtained largely from interviews (1) with individual experts, (2) with officials of U.S. companies involved in the photovoltaics industry, the Solar Energy Industry Association (SEIA), the Solar Energy Research Institute (SERI), the Departments of Energy (DOE) and State, and U.S. Embassies in Italy, France, and West Germany, and (3) with several French Government officials.

AD-A106 885/7 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Potential Impediment of Foundry Capacity Relative to National Defense Needs.
15 Sep 81, 20p Rept no. GAO/EMD-81-134

Foundries, which produce castings by pouring molten metal into a mold, are one of the Nation's most basic industries. As the fifth largest manufacturing industry, it produces 15 to 20 million tons of castings annually at a value of more than $21 billion. These castings provide critical components in aircraft, automotive, construction, energy, military equipment, and railroad industries and are found in 90 percent of U.S. manufactured items. Foundries, 97 percent of which are small businesses employing less than 250 people, employ more than 420,000 people and are located in all 50 States. Despite this key position, the number of foundries has declined by 1,479 since 1957 at a fairly steady rate, leaving the United States with 4,279 foundries in September 1980. Most of these were relatively small sized foundries; however, within the past year a significant number of larger automotive and other foundries have closed. The effect of closures on domestic capacity and specifically surge capacity is a significant area of concern.

AD-A107 182/8 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. General Government Div.
The Comptroller of the Currency Should Decide the Extent to Which His Action Control System is Needed.
28 Sep 81, 6p Rept no. GAO/GGD-81-93

This letter is one result of our study of changes in bank supervision since 1976. The objective of that study is to see if banking supervision has improved in the last 5 years. Because quality supervision requires current and accurate information, we assessed the banking supervisory agencies' efforts to obtain and use better information on banks. Our analysis of the information that agencies are receiving led us to the Comptroller of the Currency's (OCC) ACS (Action Control System). First, our overall study of supervisory changes included a sample of cases of banks requiring special supervisory attention. We selected these cases to assess how the banking supervisory agencies are dealing with bank problems. At OCC we determined how ACS was used. We also discussed the system with OCC headquarters and regional officials. In addition, we studied documents prepared by OCC staff which described and evaluated the system. Despite its laudable goal of monitoring banks of special concern to OCC, ACS has not been used to the extent originally envisioned. ACS was designed to give OCC a fast communication link so it could take quicker and more uniform action against banks of concern than it could previously. The OCC committee studying ACS is not going far enough. It is trying to improve ACS' usefulness by redesigning its format. However, it is not addressing the question of extent to which ACS is needed to solve the perceived problem. Although a need for a standardized monitoring system may exist, ACS may not be the right system to fulfill that need.

AD-A107 283/4 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
HUD Should Strengthen Mortgagee Monitoring to Reduce Losses.
9 Jun 81, 25p Rept no. GAO/CED-81-108

Dept. of Housing and Urban Development-approved mortgage lenders--mortgagees--are responsible for originating and servicing HUD-insured single-family loads. If a mortgagee does not adequately assess the prospective home buyer's ability to repay a loan and/or does not provide proper servicing of the loan, defaults, foreclosures, and substantial losses to the Federal Government can occur. In fiscal year 1980, HUD sold 13,698 single-family homes that it had acquired after foreclosures at a loss of about $183 million--about $13,400 on the average for every property sold. Improved loan origination and servicing would reduce foreclosures and the Government's losses. GAO found that HUD needs to improve mortgagee monitoring by: (1) establishing more realistic mortgagee review goals; (2) concentrating on mortgagees that need monitoring the most; (3) providing more extensive review coverage; and (4) improving the quality and comprehensiveness of reviews.

AD-A107 489/7 PC **A05**/MF **A01**
Institute for Defense Analyses, Arlington, VA. Science and Technology Div.
The Critical Technologies Project Executive Summary.
Rept. for Dec 79-Oct 80,
Ronald A. Finkler. Jan 81, 97p IDA-R-258, IDA/HQ-81-23259, AD-E500 431
Contract MDA903-79-C-0018

This report provides an overview of the Critical Technologies Project whose objective is to develop for DoD recommended entries for the Militarily Critical Technologies List (MCTL) in selected technology areas for their consideration as a first step in meeting the Congressional mandate to introduce an MCTL into the export control procedures. This report is an executive summary of work performed by the IDA/DoD/Industry Technical Working Groups (TWGs).

AD-A107 509/2 PC **A06**/MF **A01**
Naval Postgraduate School, Monterey, CA.
The Role of the Armed Forces in the Mexican Economy in the 1980's.
Master's thesis,
Vicente E. P. Mendoza. Jun 81, 102p Rept no. NPS-54-81-006

It is common belief that expenditures for defense harm the economic growth of countries. Mexico presents a special case in this respect, because its expenditures on defense expressed as a percentage of its GNP, represent an average of 0.71% in the last thirty years. This thesis provides an awareness of the key role that the Armed Forces have played in Mexico's economic growth. Defense expenditures have not harmed economic growth. Rather, in fullfillment of their duties the Armed Forces produce a spin-off effect in the economy by supplying skilled manpower, education and training, and generating an aggregate demand. The Armed Forces can contribute to the achievement of National objectives without neglecting their military duties through programs of technology, employment, education and training, shipbuilding, food production and nursing, and social programs. (Author)

DOE/EIA-0093 PC **A02**/MF **A01**
Department of Energy, Washington, DC. Energy Information Administration.
National Electric Rate Book: Rhode Island.
Aug 78, 7p

Rate schedules for electric service in communities of 2,500 or more for residential, commercial, and industrial services are presented for Rhode Island. In addition to communities of 2,500 or more, all towns and villages with populations between 1,000 and 2,500 served under residential rate schedules available in the larger communities are listed. Rate schedules include customers for lighting, heating, power, and other purposes. Omitted are those applicable exclusively to resale service, railways, government bodies, agricultural, and rural service. (ERA citation 04:053342)

LBL-11349 PC **A04**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Labor Market Projections Model: A User's Guide to the Population, Labor Force, and Unemployment Projections Model at Lawrence Berkeley Laboratory.
E. Schroeder. Aug 80, 69p
Contract W-7405-ENG-48

In an effort to assist SESA analysts and CETA prime sponsor planners in the development of labor-market information suitable to their annual plans, the Labor

Market Projections Model (LMPM) was initiated. The purpose of LMPM is to provide timely information on the demographic characteristics of local populations, labor supply, and unemployment. In particular, the model produces short-term projections of the distributions of population, labor force, and unemployment by age, sex, and race. LMPM was designed to carry out these projections at various geographic levels - counties, prime-sponsor areas, SMSAs, and states. While LMPM can project population distributions for areas without user input, the labor force and unemployment projections rely upon inputs from analysts or planners familiar with the economy of the area of interest. Thus, LMPM utilizes input from the SESA analysts. This User's Guide to LMPM was specifically written as an aid to SESA analysts and other users in improving their understanding of LMPM. The basic method of LMPM is a demographic cohort aging model that relies upon 1970 Census data. LMPM integrates data from several sources in order to produce current projections from the 1970 baseline for all the local areas of the nation. This User's Guide documents the procedures, data, and output of LMPM. 11 references. (ERA citation 05:033673)

LBL-9959 PC **A05**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Utility Solar Finance: Economic and Institutional Analysis.
E. Kahn, L. Ross, P. Benenson, and J. Cherry. Oct 79, 95p
Contract W-7405-ENG-48

Various forms of utility solar finance are analyzed. This analysis will delineate the complexity of the regulatory issues involved with any scheme which uses public utilities as financial intermediaries for on-site solar. The study begins with concrete examination of various types of utility solar financing arrangements. The focus is on the costs of each arrangement to the utility. The discussion then broadens to consider the generic economic impacts of utility solar finance on both the customer and the corporation. With this background, the broader social issues associated with utility involvement in the solar market are surveyed. The legal and regulatory concerns which would shape practical utility solar finance programs are delineated. The particular cost factors that determine economic viability of utility solar finance are examined in a detailed case study. Finally, the complex interactions of federal taxation and state regulatory practices are described. (ERA citation 05:006711)

PB82-107327 PC **A03**/MF **A01**
Kentucky Dept. of Energy, Lexington.
The Cooperative Coal Marketing Arrangement in Eastern Kentucky: A Feasibility Report.
Final rept.
Jul 81, 48p ARC-78-89-6512

The feasibility and means of establishing cooperative marketing arrangements to enable small independent coal producers to gain access to large-volume, long-term markets and economies of scale are described in this report. Interviews revealed that small coal operators perceive their marketing problems as sufficiently real and serious to require adoption of new cooperative marketing practices and movement away from traditional, individualistic, practices. The physical criteria for establishment of cooperative arrangements in Eastern Kentucky are described and evaluated by county.

PB82-128646 PC **A10**/MF **A01**
Fish and Wildlife Service, Arlington, VA. Federal Wildlife Permit Office.
Convention on International Trade in Endangered Species of Wild Fauna and Flora; 1979 Annual Report for the United States of America.
Summary rept.,
Paul E. Gertler. 1979, 215p FWS/FWPO-81/01

Fifteen tables present all reported 1979 data on international trade in which the U.S. was involved in species listed on the appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Data on species, quantities, countries involved, purpose of trade and description of products or organisms are provided. The introduction includes a description of methodology involved in report production and a biennial report on U.S. actions during 1978 and 1979 to implement CITES.

PB82-129065 PC **A03**/MF **A01**
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
Revenue and Cost Allocations: Policy Means and Ends in the Railroad and Telecommunications Industries,
Robert Carson Godbey. c1979, 41p PUB-P-79-2

Increasing competition within the telecommunications industry is calling into question the present system of nationwide rate averaging and subsequent revenue pooling. The railroad industry, which similarly offers interstate service involving more than one company, has developed a technique of revenue distribution which establishes the rate for each route independently and provides for the subsidization of weak lines. The author describes the railroad industry's division of revenues and points out how differently problems common to both industries have been handled. He suggests that if the telecommunications environment comes to resemble that of the railroad industry, an understanding of the pros and cons of the railroad approach will assist the development of future telecommunications policy.

PB82-129503 PC **A19**/MF **A01**
Transportation Systems Center, Cambridge, MA.
Profiles of Automotive Suppliers Industries-Engineered Mechanical Components and Systems: Volume I, Text.
Final rept. Sep 80-Jan 81,
Phoebus R. Kaldobsky, and Nancy E. Fava. Sep 81, 433p DOT-TSC-NHTSA-81-21-1, DOT-HS-805 975
See also Volume 2, PB82-129511.

This profile describes and analyzes that segment of the automotive supplier industry which provides engineered mechanical components/assemblies/systems to the prime auto manufacturers. It presents an overview of the role and structure of this industry and of its historical business performance data (1975 through 1979). It profiles, in some detail, 76 leading companies in this industry, and discusses domestic and foreign changes and growing international competition. It provides an assessment of capital requirements, of structural changes in the industry, and of evolving suppliers' strategy and tactics.

PB82-129511 PC **A09**/MF **A01**
Transportation Systems Center, Cambridge, MA.
Profiles of Automotive Suppliers Industries-Engineered Mechanical Components and Systems: Volume II, Appendices.
Final rept. Sep 80-Jan 81,
Phoebus R. Kaldobsky, and Nancy E. Fava. Sep 81, 189p DOT-TSC-NHTSA-81-21-2, DOT-HS-805 976
See also Volume 1, PB82-129503.

The profile describes and analyzes that segment of the automotive supplier industry which provides engineered mechanical components/assemblies/systems to the prime auto manufacturers. It presents an overview of the role and structure of this industry and of its historical business performance data (1975 through 1979). It profiles, in some detail, 76 leading companies in this industry, and discusses domestic and foreign changes and growing international competition. It provides an assessment of capital requirements, of structural changes in the industry, and of evolving suppliers' strategy and tactics.

PB82-130881 PC **A04**/MF **A01**
Agricultural Cooperative Service, Washington, DC.
Ship Chartering Alternatives for Grain-Exporting Cooperatives.
Research rept.,
Donald E. Hirsch. Feb 81, 58p ACS/RR-2
Errata sheet inserted.

Sellers, including some farmer cooperatives, chartered vessels for shipping overseas nearly half of the U.S. grain exported in 1978. Chartering (leasing) offers opportunities for substantial increases in net gains, resulting from greater net margins on shipping and deeper penetration into the grain export marketing process, but also involves the risk of substantial losses. Most grain cooperatives do not have the volume, expertise, facilities, capital, and operating flexibility essential for successful chartering. This report recommends a course of action that would increase cooperatives' chartering capabilities and enhance their competitive position in the international grain trade.

PB82-131590 PC **A04**/MF **A01**
Research Inst. for Community Economic Development, St. Louis, MO.
Final Report of the Research Institute for Community Economic Development, St. Louis, Missouri, June 1, 1978-September 14, 1979.
Oct 81, 73p EDA-81-0130
Grant EDA-05-06-01791

The report documents work in carrying out the approved scope of services for the grant. Essentially, that scope had two major thrusts: (1) business development, and (2) commercial/industrial real estate redevelopment.

PB82-131608 PC **A16**/MF **A01**
Harvard-MIT Joint Center for Urban Studies, Cambridge, MA.
New England Economy Project: Case Study Summaries, Policy Analysis, and Research Methodology,
Bennett Harrison. 31 Mar 81, 367p NIMH-81-44
Grant EDA-OER-620-G-78-14
Sponsored in part by Employment and Training Administration, Washington, DC.

The report includes summaries of ten industry case studies: aircraft and parts, commercial banking, commercial printing, computer manufacturing, department stores, grocery stores and supermarkets, hospitals, hotels and motels, metalworking machinery, paper mills. It also contains a synthesis of the impact of government policy and regulation on New England industry. Finally, this report describes the research methodologies used: industry selection, firm selection, field work, survey instrument, and supporting data bases.

PB82-132366 PC **A08**/MF **A01**
Williams (Charles W.), Inc., Alexandria, VA.
Future Developments in the Food Industry and Their Implications for the Federal Trade Commission.
Jul 80, 167p FTC/OPP-81/06
See also PB82-132374.
Also available in set of 3 reports PC E13, PB82-132358.

The paper presents the results of a modest experimental project whose purpose was to: Develop forecasts of future developments in the food industry that are relevant to FTC's interests; define related strategic implications for the Commission; evaluate the value of such an approach for FTC management and define for the Commission any appropriate next steps. Individual chapters contained in the report outline the following: (1) The major future developments within the food industry itself; (2) Writer's analysis and conclusions about how these developments within the food industry will affect the FTC; (3) Evaluation of the relevance of this approach for FTC management needs and recommendations for next steps; (4) The more or less generalized aspects of national and international developments which writer believes will have a major impact upon the future of the food industry; and (5) An appendix containing selected statistical and other data which describes general food industry trends.

PB82-132374 PC **A05**/MF **A01**
Williams (Charles W.), Inc., Alexandria, VA.
Future Developments in the Food Industry: Probable Efforts at Vertical Integration by Food Retailers.
Jul 81, 78p FTC/OPP-81/07
See also PB82-132382.
Also available in set of 3 reports PC E13, PB82-132358.

The writer's basic proposition is that sociological bias and regulatory and social constraints placed on national, branded food processors will combine with several key trends to create vertical integration in the food industry in the 1990s. This vertical integration will be led by a combination of farmers and agricultural producers, possibly uniteing into a coalition, who will place increasing competitive pressure on national food processors. These processors will be required to find innovative marketing concepts or be pushed into an increasingly weaker position within the food industry. This report contains an introduction and an executive summary, a review of those factors which are expected to influence vertical integration, possible scenerios, and implications of interest to the FTC.

PB82-132382 PC **A03**/MF **A01**
Williams (Charles W.), Inc., Alexandria, VA.
Future Developments in the Food Industry: Probable Emergence of Near Field Fermentation Conversion Centers.
Jul 81, 31p FTC/OPP-81/08
See also PB82-132366, and PB82-132374.
Also available in set of 3 reports PC E13, PB82-132358.

This paper outlines the concept of an evolving food processing technology, the system that technology will create, and the implications most significant to the FTC. While fermentation has been used in processing for thousands of years, these new, near field centers will introduce a number of fundamental changes to the technological and institutional structure of the food industry. This technology will operate as an integrated conversion process that will be a focal point of convergence across several traditional industrial boundaries, including: agriculture, food processing and manufacture, chemicals, pharmaceuticals and energy. This report includes an introduction and an executive summary; a scenario of the near field fermentation conversion center in operation; implications of such a system to the FTC; and a background of the driving forces from which such a system will evolve.

PB82-133497 PC **A08**/MF **A01**
Arizona Univ., Tucson. Div. of Economic and Business Research.
Development of Compatible State - SMSA Econometric Models.
Final rept.,
Carol A. Taylor, and Alberta H. Charney. 1981, 165p NSF/SES-81005
Grant NSF-DAR79-09489
See also PB82-133505.

The development of a state-substate compatible econometric model and its empirical application to the state of Arizona is described. The model is 'compatible' in the sense of yielding consistent forecasts for a state and a completely covering set of substate areas. It is a detailed econometric model of Arizona, its two Standard Metropolitan Statistical Areas (SMSAs), Phoenix and Tucson, and the aggregated non-metropolitan balance of the state. Designed for short-term forecasting, the model focuses on employment, population and labor force, income, and state-shared revenues. In addition, it estimates a variety of auxiliary variables used to forecast these primary variables. It contains 289 stochastically estimated equations which are solved by using the Gauss-Seidel technique. Three basic methodologies were examined for obtaining consistent state-substate estimates for any single model variable in the development of the Arizona model. Results of the study indicate that the model is accurate and compares well both with previous econometric models of the Arizona areas and with other regional models.

PB82-133505 PC **A11**/MF **A01**
Arizona Univ., Tucson. Div. of Economic and Business Research.
Development of Compatible State - SMSA Econometric Models: Appendices.
Final rept.,
Carol A. Taylor, and Alberta H. Charney. 1980, 243p NSF/SES-81006
Grant NSF-DAR79-09489
See also PB82-133497.

This volume consists of appendices to a study of the development of a state-substate compatible econometric model and its empirical application to the state of Arizona. They include analyses of the following: data bases for employment, taxes, and tourism; technical derivations; and a complete print-out of the compatible state-substate model and state-only model used in the study. A list of standard industrial classification codes and a bibliography are provided.

PB82-134180 PC **A02**/MF **A01**
Urban Inst., Washington, DC.
Energy Conservation and the Demand for Labor: Evidence from Aggregate Data.
Final rept. Oct 80-May 81,
Richard Morgenstern, and Wayne Vroman. May 81, 20p ASPER/PUR-81/1009/A
Contract DL-B-9-M-1-1009

The objective of this study was to explore the relationship between aggregate employment and output, with special reference to the 1979-1980 experience. An indirect relationship was posited between energy price shocks and the occupational mix. Specifically, it was hypothesized that the energy price shocks of 1978-1979 (and possibly 1973-1974) may have created new investment opportunities for simple, short term energy conservation type investments which may, in turn, have increased the demand for blue collar labor. A framework for viewing the problem is described and the basic hypothesis tested by estimating a time series model of occupational/industrial employment patterns. Included in the model is a set of variables designed to measure the energy price shocks.

PB82-134255 PC **A02**/MF **A01**
Turtle Mountain Band of Chippewa Indians, Belcourt, ND.
Support Services for the Turtle Mountain Shopping Center.
Mar 80, 13p EDA-81-0131
Grant EDA-05-06-01835

The report covers the period April 1, 1979 thru March 31, 1980. It reports on activities performed during that period on the Turtle Mountain Shopping Center project.

PB82-134321 MF **A01**
Department of Commerce, Washington, DC.
Business America - The Magazine of International Trade, Volume 4, Number 24, November 30, 1981.
Biweekly pub.
30 Nov 81, 44p
See also Volume 4, Number 21, PB82-117839.
Paper copy available from Supt. of Docs.

Contents:
A.I.D. stresses private sector participation;
World trade fair schedule for 1982;
Economic highlights;
Business outlook abroad;
Worldwide business opportunities.

PB82-134396 PC **A09**/MF **A01**
Applied Concepts Corp., Reston, VA.
A Study of Metric Conversion of Distilled Spirits Containers: A Policy and Planning Evaluation: Task I. Comprehensive Report on the Conversion Process,
James A. Simpson. 5 Aug 81, 187p
Contract DOC-AA-80-SAC-X8602
Sponsored in part by United States Metric Board, Arlington, VA.

Chapter I presents a brief overview of the distilled spirits industry in order to understand the context of events and issues addressed in later chapters. Chapter II analyzes the motivation phase, during which a consensus was reached within the industry that conversion was a desirable objective and should be pursued. Chapter III analyzes the planning phase, when the details of the conversion were discussed and decided upon by the parties involved. Chapter IV describes and analyzes the events, issues, and problems of the implementation phase of the conversion. In Chapter V, the costs and savings resulting from the conversion are analyzed. Chapter VI analyzes the impacts of the conversion on prices, and Chapter VII the impacts on consumption, profitability, industry structure, and size, product, and brand preferences. Chapter VIII summarizes the important findings and conclusions from the research. Lastly, an Appendix presents in chronological order the dates and descriptions of events and activities related to the conversion which were uncovered during the course of this research.

PB82-135211 PC **A04**/MF **A01**
Economic Research Service, Washington, DC. Natural Resource Economics Div.
State Laws Relating to the Ownership of U.S. Land by Aliens and Business Entities.
Staff rept.,
Joseph W. Mayer. Nov 81, 64p AGES-811113

A significant number of States have laws directed at the ownership of U.S. land by aliens and business entities. These laws vary greatly from State-to-State in the degree of their severity. Thirty States have some type of law restricting alien ownership of land. Eight States require aliens to report their landholdings within the State. Thirteen States restrict business entities from owning land or engaging in the business of farming. Ten States have laws requiring business entities to report their landholdings within the State. An individual State may be included in more than one of the above categories.

PB82-135278 PC **A06**/MF **A01**
Response Analysis Corp., Princeton, NJ.
The Marketing of Alcoholic Beverages. Phase II: An Analytical Framework for Information About Marketing Practices and Consumer Purchasing of Beverage Alcohol Products,
P. A. Scipione. 12 Sep 80, 112p NIAAA/NCALI-81-21
Contract PHS-ADM-281-78-0020
See also PB82-138579, and Phase 1, PB82-135286.

Phase II of a two-phase study designed to assist the National Institute on Alcohol Abuse and Alcoholism (NIAAA) in understanding both marketing practices and consumer purchasing of alcoholic beverages is presented. This report contains an analytical framework (set of basic concepts, analytical perspectives, and practical procedures) that provides a systematic way of attempting to answer questions which may arise concerning industry practices or consumer purchasing. Components and the application of this framework are described.

PB82-135286 PC **A09**/MF **A01**
Response Analysis Corp., Princeton, NJ.
The Marketing of Alcoholic Beverages. Phase I: Literature Report,
P. A. Scipione. Sep 79, 185p NIAAA/NCALI-81/20
Contract PHS-ADM-281-78-0020
See also Phase 1, PB82-135278, and PB82-138579.

In this report, results of the first part of a two-part study of the marketing of alcoholic beverages are presented. The overall objective of this report is to assist the National Institute on Alcohol Abuse and Alcoholism (NIAAA) in gaining a more complete understanding of the environment in which Americans purchase and consume alcoholic beverages. An introductory overview is provided, including details on how the study was conducted. The model of the marketing process is presented, and each of its components is detailed. The report concludes with a summarizing review of the model and a description of information sources on alcoholic beverage marketing. A selected bibliography is also provided.

PB82-135997 PC **A04**/MF **A01**
Small Business Administration, Washington, DC.
Initial Public Offerings of Common Stock: The Role of Regional Broker-Dealers in the Capital Formation Process: Phase I Report.
Final rept.
Mar 80, 65p
Prepared in cooperation with Securities and Exchange Commission.

This study by the Securities and Exchange Commission will develop and analyze data on the importance of regional broker-dealers in the initial securities offerings of corporate issuers. An examination of the market-making activities of these broker-dealers and their role in securities research of new issuers also will be conducted by the SEC. The relationship between the unfixing of commission rates and the number of regional broker-dealers for this class of issuer will be investigated in light of SBA concerns for the underwriting capacity of the industry.

PB82-136003 PC **A05**/MF **A01**
Small Business Administration, Washington, DC.
The Role of Regional Broker-Dealers in the Capital Formation Process: Underwriting, Market-Making and Securities Research Activities: Phase II Report.
Final rept.
Aug 81, 85p
Prepared in cooperation with Securities and Exchange Commission.

This study by the Securities and Exchange Commission will develop and analyze data on the importance of regional broker-dealers in the initial securities offerings of corporate issuers. An examination of the market-making activities of these broker-dealers and their role in securities research of new issuers also will be conducted by the SEC. The relationship between the unfixing of commission rates and the number of regional broker-dealers for this class of issuer will be investigated in light of SBA concerns for the underwriting capacity of the industry. SEC will conduct at least one workshop for SBA regional advocates on the economics of the securities industry.

PB82-137498 MF **A01**
Department of Commerce, Washington, DC.
Business America - The Magazine of International Trade, Volume 4, Number 25, December 14, 1981.
Biweekly pub.
14 Dec 81, 41p
See also Volume 4, Number 16, PB81-216400.
Paper copy available from Supt. of Docs.

Contents:
- Multilateral Trade Negotiations implementation proceeds on several fronts;
- Under Secretary Olmer testifies on Japan trade;
- Guide to world commercial holidays in 1982;
- Foreign industrial output dips in third quarter;
- Offshore oil finds in Norway require new equipment;
- Mission members get course in Japanese tastes and mechanics of the Japanese jewelry industry;
- Business outlook abroad;
- Worldwide business opportunities.

PB82-138579 PC **A02**/MF **A01**
Response Analysis Corp., Princeton, NJ.
Marketing Practices in the Alcoholic Beverages Industry: Toward an Understanding of How Macro-Environmental Forces Shape Marketing Strategies in the Alcoholic Beverage Industry. A Supplement to Phases I and II,
Paul N. Bloom. Sep 81, 24p RAC-4285, NIAAA/NCALI-81-22
Contract PHS-ADM-281-78-0020
See also Phase II, PB82-135278. Prepared in cooperation with Maryland Univ., College Park. Coll. of Business and Management.

A supplement to Phase I and II of a study designed to assist the National Institute on Alcohol Abuse and Alcoholism (NIAAA) in understanding both marketing practices and consumer purchasing of alcoholic beverages is presented. In this supplement, an attempt is made to point out the importance of understanding how industry marketing practices (both domestic and international) can be influenced by macro-environmental forces. A model of the alcoholic beverage industry and its external domestic and international environments is presented, and the role of political-legal, economic, sociocultural, and technological forces in the industry is described, including how these four forces might directly or indirectly affect the industry's marketing strategies. Some suggestions are offered on research priorities for addressing the various questions raised throughout the paper. Contents of the two main substantive reports (Phase I and II) are appended.

PB82-141821 PC **A11**/MF **A01**
Young (Arthur) and Co., Washington, DC.
A Profile of the Medical Technology Industry and Governmental Policies. Volume I.
Final rept. 1 Oct 79-30 Jun 81,
H. Elizabeth Wenchel. 30 Jun 81, 246p NCHSR-81-223
Contract PHS-233-79-3011
See also Volume 2, PB82-141839. Prepared in cooperation with the Emergency Care Research Inst., Plymouth Meeting, PA.
Also available in set of 3 reports PC E15, PB82-141813.

This document is one part of a three-part report profiling the medical technology industry using an industrial organization (I.O.) economics approach and secondary data sources. Volume I provides an in-depth description of the industry in terms of structure (concentration, barriers to entry, etc.); conduct (decision-making processes related to price, output, etc.); and performance (new patents, profits, etc.). It also provides an overview of government policies affecting the industry. In Volume II, the I.O. approach is applied in a case study of the effects of Medicare/Medicaid reimbursement and the 1976 Medical Device Amendments on the pacemaker industry. Appendix A provides an analysis of the adequacy and availability of the various aggregated, firm specific, and specialized data bases. Collectively the documents contribute to the identification of influences affecting innovation and the description of what has happened to firms entering or exiting the market and factors associated with survival. The application of the industrial organizational methodology was tested in a case study of the cardiac pacemaker industry. The limitations of using existing secondary data sources for such analyses are discussed in detail.

PB82-141839 PC **A05**/MF **A01**
Young (Arthur) and Co., Washington, DC.
A Profile of the Medical Technology Industry and Governmental Policies: A Study of the Effects of Medicare/Medicaid Reimbursement and the 1976 Medical Device Amendments on the Pacemaker Industry. Volume II.
Final rept. 1 Oct 79-30 Jun 81,
H. Elizabeth Wenchel. 30 Jun 81, 89p NCHSR-81-224
Contract PHS-233-79-3011
See also Volume 1, PB82-141821 and Appendix A, PB82-141847. Prepared in cooperation with the Emergency Care Research Inst., Plymouth Meeting, PA.
Also available in set of 3 reports PC E15, PB82-141813.

This document is one part of a three-part report profiling the medical technology industry using an industrial organization (I.O.) economics approach and secondary data sources. In Volume II, the I.O. approach is applied in a case study of the effects of Medicare/Medicaid reimbursement and the 1976 Medical Device Amendments on the pacemaker industry. Collectively the documents contribute to the identification of influences affecting innovation and the description of what has happened to firms entering or exiting the market and factors associated with survival. The application of the industrial organizational methodology was tested in a case study of the cardiac pacemaker industry. The limitations of using existing secondary data sources for such analyses are discussed in detail.

PB82-144338 PC **A99**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Program in Industrialization of the Housing Sector.
Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume II. The Mobile Home Production System,
Arthur D. Bernhardt, Kenneth A. McPherson, Peter H. Greenwood, Herbert B. Zien, and Charles B. Goldfarb. 15 Jul 76, 967p HUD-0001554
Contract HUD-H-1682

Part of a five - volume series on the structure, operation, performance, and development trends of the mobile home industry, this report examines supply sector influence, industrial organization, manufacturing, cost / price analysis, and manufacturer financing. An estimated 1,500 firms supply the mobile home industry. Results of Project Mobile Home Industry's survey of all known supplying firms showed that the modal firm in a sample of 188 suppliers had just 1 product, but over 10 percent had as many as 5. The report suggests that the mobile home industry has the potential to counteract elements of monopoly power that appear to exist in the supply sector. Historical constraints that have encouraged the current structure of the mobile home production system are discussed as well as the structure of the mobile home production system that leads to patterns of operation characterized by high levels of entry and exit.

PB82-144346 PC **A99**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Program in Industrialization of the Housing Sector.
Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume III: The Mobile Home Distribution System,
Arthur D. Bernhardt, Winston Chiong, Herbert B. Zien, Kenneth A. McPherson, and Ahmet C. Tekiner. 15 Jul 76, 775p HUD-0001555
Contract HUD-H-1682

Part of a five - volume series on the structure, operation, performance, and development trends of the mobile home industry, this report examines industrial organization, distribution, cost / price analysis, dealer financing, and consumer financing of the mobile home distribution system. Mobile home dealers, numbering 13,513 in 1974, are highly decentralized, and regional differentials in the number of outlets are substantial. Basic areas for improvement in the industrial organization are suboptimal spatial distribution of the existing outlets, excess capacity, and serious seasonal fluctuations. The average annual mobile home dealership sales volumes have risen from about $192,000 in 1963 to $895,000 in 1972. The distribution system has evolved from small, family - owned operations to large, incorporated dealerships. Most dealers have become sophisticated in the sales and servicing of mobile homes as "permanent" residential units.

PB82-144353 PC **A99**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Program in Industrialization of the Housing Sector.
Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume IV: The Mobile Home Park System,
Arthur D. Bernhardt, Michael Burrill, Herbert B. Zien, and Thomas R. Dibenedetto. 15 Jul 76, 706p HUD-0001556
Contract HUD-H-1682

Part of a five - volume series on the structure, operation, performance, and development trends of the mobile home industry, this report examines the mobile home park. Sections concern industrial organization of the mobile home park system, park development and operation, cost / price analysis, and park financing. The primary data base for this volume was developed from responses to a national survey by hundreds of mobile home park developers, traditional subdivision developers, onsite builders, and mobile home park owners and managers. The mobile home park provides the second vital component of the industry in addition to the housing unit - namely, the developed site with foundation and utilities. The performance of the park system directly determines the supply of developed land for placement of the mobile home.

PB82-144361 PC **A99**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Program in Industrialization of the Housing Sector.
Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume V: Public Regulation,
Arthur D. Bernhardt, John M. Wallach, Frank H. Benesh, Linda S. Zack, and Norman Quon. 15 Jul 76, 672p HUD-0001557
Contract HUD-H-1682

Part of a five - volume series on the structure, operation, performance, and development trends of the mobile home industry, this report examines how land use controls, taxation, building codes, and highway regulations affect the industry. The report outlines exclusion and restriction methods in land use control, lists reasons for wide zoning practice variations, assesses the impact of land use controls on industry performance, and notes three trends in land use controls that may lead to market expansion. The impact of State taxation of mobile homes is reviewed, and the beneficial effects of realty taxation are outlined, such as market expansion, increased sales volume, and decrease unit cost for the mobile home industry. In addition, the report describes the efforts of the Mobile Home Manufacturers Association to build a nationwide, comprehensive performance code for the entire industry (American National Standards Institute (ANSI) Standard A119.1 for Mobile Homes) which is regularly amended by ANSI. Problems of State - by - State variations of A119.1 such as variations in inspection and lack of interstate reciprocity are discussed, and improvements suggested. Congressional legislation that preceded the adoption of Title VI of the 1974 Housing and Community Development Act is outlined, and the implications of Title VI for States, localities, and the mobile home industry are analyzed. The report also recommends improving three major forms of State regulation of mobile home highway movement dimension limitations, permit requirements, and traffic regulations specific to oversize vehicles. Graphs, maps, and tabular data are included. Footnotes and a table of contents are given for each section. The appendix contains a supply and demand model of mobile home rental and purchase markets; a report of New York and Pennsylvania experiences with the realty tax; 'fair share' taxation studies from California, Connecticut, and Georgia; the texts of Oklahoma and Kansas highway amgulations; and accounting sheets for highway regulation.

PB82-144395 PC **A06**/MF **A01**
Midwest Planning and Research, Inc., Minneapolis, MN.
Economic Analysis of the Single Family Property Disposition Program.
Feb 78, 116p HUD-0001723
Contract HUD-H-2657

Findings are reported from a comparative analysis of costs and benefits related to alternative single - family HUD sales programs in Region X. The study (1) compared the net financial return from HUD 'as is' sales and HUD 'repaired' sales of similar residential properties; (2) compared the external appearance, ownership, and occupancy of properties sold 'as is' and those sold 'repaired' within the same time period; (3) compared HUD repair costs with costs of similar re-

pairs done by private owners on properties sold by HUD on an 'as is' basis; and (4) estimated sellers' profits on properties which were resold by the initial purchaser, subject to being sold 'as is' by HUD.

PB82-144445 PC **A04**/MF **A01**
Urban Inst., Washington, DC.
Assessing the Effects of the Section 8 Program Using the Urban Institute Housing Market Model,
Sue A. Marshall, and Gary S. Anderson. Feb 81, 69p HUD-0002047
Contract HUD-H-2162R

For housing policymakers, this paper examines how well the Urban Institute model can perform in analyzing housing policies such as the Section 8 program. The Urban Institute housing market model is one of several large - scale, computer - based statistical models developed in the late 1960's and early 1970's to simulate complex interactions in the housing market. Understanding the behavior of the various actors involved in market interactions is essential if housing policymakers hope to influence these interactions. To assess the model's usefulness as a tool for local policymakers, this paper evaluates the experiences of local agencies using the model for such analyses. The paper presents a brief general overview of the model and summarizes the results of Section 8 simulations using the model. It then describes the experience of local agencies attempting to use the model, focusing on two cases -- the Los Angeles Community Development Department (CDD) which unsuccessfully attempted to calibrate the model and the Canada Mortgage and Housing Corporation (CHMC) which applied the model to eight Canadian metropolitan areas. The paper also compares the Urban Institute model to two other housing market models, the National Bureau of Economic Research Urban Simulation Model and the Community Analysis Model. The major conclusion drawn from experiences with the Urban Institute model presented here is that the model is a viable tool for analysis of policies such as the Section 8 program. However, the model has not been documented in sufficient detail to allow users at the local level to complete the process without assistance from someone experienced with the model. Factors which differentiate the experiences of the CHMC and the CDD in applying the model (i.e., resources, staffing, and expectations) can serve as an indication of what makes it likely that a local jurisdiction will meet with success using the model. Tabular data, footnotes, and 22 references are included. A description of the Urban Institute model is appended. (Author abstract modified).

PB82-144452 PC **A06**/MF **A01**
RAND Corp., Santa Monica, CA.
Relevance to HUD of Recent Scholarly Research in Urban Economics,
Stephen J. Carroll, Anthony H. Pascal, and Michael N. Caggiano. Sep 79, 102p RAND/N-1298-HUD, HUD-0002048
Contract HUD-H-2930

This report constitutes an experimental attempt to assess the recent scholarly literature in urban economics for its relevance to HUD's policy problems. Its purpose is to assist HUD officials responsible for the periodic review and revision of public finance and urban economic development research priorities. The report covers books by economists on urban subjects and articles which have appeared in professional journals since 1974. It introduces the topics on which policymakers concerned with urban finance and economic development issues require information. Such topics are the urban economy's base, the city's fiscal capacity, financial issues, and economic development problems. The report then describes the problems addressed by the economics literature since 1974 and compares the policymakers' topics of concern with subjects in the literature, identifying areas where the available research is particularly limited. Finally, the report notes deficiencies with respect to the volume of studies, their quality, and their direct policy relevance and discusses the kinds of research needed to fill important information gaps. Findings indicate that the 'city as an entity' was the most widely studied topic, followed by property taxes. The research on Federal policy was indicated to be wide - ranging but lacking in analytical features, while research on local government services was the best developed topic. Overall, the treatment of the economic base is inadequate from a policymaking standpoint, although the literature provides a theoretical context. Furthermore, the deficiencies identified in the extant literature suggest research priorities for HUD. Generally, HUD's objectives should be to promote the development of a better information base on urban finance and local economic development. Appendices present a quality ranking of journals and a bibliography listing books and articles on urban finance and economic development noted by the 'Journal of Economic Literature' between 1974 and 1978.

PB82-144502 PC **A02**/MF **A01**
National League of Cities, Washington, DC.
Northeast Municipal Economic Development. A National League of Cities Study of Municipal Economic Development Needs, Capacities and Perceptions in the Northeast,
Holly Wallace. Sep 79, 15p HUD-0002059
Contract HUD-H-4435
Sponsored in part by the Department of Housing and Urban Development,Washington, DC. Office of Community Planning and Development.

Findings are reported from a National League of Cities survey of the organizational, programmatic, and budgetary capacities and perceptions regarding economic development of 40 Northeast municipal governments. Cities and towns in eight of the nine Northeast States completed the survey. A narrative description of the findings is provided, including comparisons with national findings, followed by detailed information from selected survey questions. Most responding cities have economic development departments with one or two staff members -- slighty fewer than the national average. However, they are much more likely to have hybrids of quasi - public economic development authorities, corporations, or councils, so that economic development is more institutionalized than in many parts of the country. Generally, Northeastern cities have made greater progress toward formally adopting economic development plans and strategies and implementing programs than have cities in other regions. Unlike the rest of the country, Northeastern cities believe property taxes, infrastructure maintenance, and bus and subway service are major facilitators of economic development, reflecting their concern about declining population, business, tax base, and employment. They are also stronger proponents of increased Federal aid for city economic development than are cities in other regions. The survey questionnaire is also provided.

PB82-144510 PC **A04**/MF **A01**
Coalition of Northeast Municipalities, Boston, MA.
Can Community Economic Development Meet the Fiscal Needs of Municipalities. Economic Growth and Fiscal Stress in Three Northeast Cities,
William Montrone. Sep 80, 66p HUD-0002060
Contract HUD-H-4435

The relationship between municipal fiscal condition and economic resurgence is examined in Boston, Mass., Hartford, Conn., and Portland, Maine. All three cities have, to some degree, experienced downtown revitalization, neighborhood development, and industrial expansion. Stimulated by innovative Federal development approaches -- notably, the Urban Development Action Grant and the Community Development Block Grant -- these local economic development efforts have often reversed the economic decline which has plagued the old fully developed communities of New England. The result of this economic stimulation has been a reduction in unemployment rates, an increase in wages, reuse of vacant industrial buildings, and renewal of blighted areas. The fiscal health of the local governments, however, has not kept pace with the economic development of the cities. Fiscal analysis shows increasing revenue shortfalls in all three cities in coming years. The shortfalls are generally due to (1) the inability of the city's property tax base to produce sufficient additional revenue growth, (2) the reduction in Federal and State assistance, and (3) the persistence of high inflation rates which erode the city's purchasing power. Recommendations for increasing revenues include property tax reform, linking the benefits of economic development with local government finance, and increasing State and Federal assistance. Other recommendations involve implementing cost controls and expanding revenues from such local revenue sources as licenses and permits, fines, sales of city property, interest on investments, and user fees. Tabular data are provided from each study, and notes are included.

PB82-144627 PC **A22**/MF **A01**
New York Univ., NY. Salomon Bros. Center for the Study of Financial Institutions.
Risk of Inner-City Mortgage Lending,
Robert Lindsay, David Listokin, Emanuel Tobier, and Alex S. Avitabile. Aug 79, 513p HUD-0002072
Grant HUD-H-2870RG

This study examines the nature of risk involved in mortgage lending in the inner city and explores public and private strategies for dealing with this risk, emphasizing case experiences in several cities and one State. The report begins with a discussion of the meaning and measure of mortgage risk and contrasts the internal cost flows of normal risk mortgage loans with the heightened costs of extra risk. The examination shows that it is both more difficult and more expensive to get the capital needed to grant urban loans. Moreover, even if capital can be secured, urban loan origination can be laborious, requiring extra servicing effort and expense; there is the further hazard of a higher incidence of loan delinquency / foreclosure and a larger loss per bad loan. While these hurdles exist, several case examples show that the problems of urban lending are not insurmountable and can be handled if appropriate strategies are followed. Four chapters analyze successful approaches involved in the Philadelphia Mortgage Plan, the CPC and Citibank strategies in New York City, the South Shore lending program in Chicago, and the Neighborhood Loan Program administered by the New Jersey Mortgage Finance Agency. An additional chapter summarizes and evaluates the strategies used by a large mutual savings bank in New York City to deal with the troubled portion of its multifamiy loan portfolio. Among potential government strategies for raising capital funds for urban lending are the issuance of tax exempt bonds to finance takeouts from private lenders with the proceeds and the selective depositing of public funds with those private financial institutions which have been most active in urban lending. Counseling and establishing a separate urban loan department are suggested approaches to facilitate originating urban loans. Ways to reduce loan servicing expenses include careful monitoring of loan status and reacting quickly when problems are detected. It is recommended that multiple strategies be used and that systemwide changes and effects be considered. Tables and chapter reference lists are provided.

PB82-144999 PC **A04**/MF **A01**
Peat, Marwick, Mitchell and Co., Washington, DC.
Real Estate Closing Costs: Real Estate Settlement Procedures Act (RESPA), Section 14a. Volume I: Executive Summary.
Apr 81, 63p HUD-0002126
Contract HUD-H-2910

This study seeks to determine how well the settlement process is working and, specifically, how individual settlement service markets are performing to provide required services at a reasonable cost. The study also evaluates the effectiveness of the Real Estate Settlement Procedures Act of 1974 (RESPA) in achieving its objectives: informing the consumer, increasing the incidence of shopping, and ultimately lowering settlement costs where they are excessive. In addition, the study assesses the feasibility and desirability of modifications and alternatives to RESPA. Two principal research tools were used in addressing the study's objectives: a national survey of 18,000 Uniform Settlement Statements and a number of local market studies. The local market studies involved eight markets, including Boston, Mass.; Denver, Colo.; Jacksonville, Fla.; Los Angeles, Calif.; San Antonio, Tex.; and Seattle, Wash. In addition, more than 80 personal interviews were conducted with national, State, and local public officials and officers of relevant industry associations. Three interrelated components of RESPA were studied to assess the act's effectiveness: compliance / implementation, systems changes, and price impact. Results showed that the letter and intent of the RESPA provisions are, for the most part, being followed. Overall findings concerning all or several of the settlement service markets show that consumers are relatively uninformed about settlement services, competition exists primarily for referrals rather than for the consumer's business, and some provider practices exist that appear to add unnecessarily to settlement charges. In addition, the report discusses the performance of the brokerage industry, the mortgage lending industry, the private mortgage insurance industry, and the title assurance and conveyancing service industries; and the role of attorneys in settlement services. Alternatives related to improving the performance and services of these industries are detailed, along with suggestions for improving consumer information. Footnotes are provided.

PB82-802380 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Effects of Inflation. 1978-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1978-Nov 81.
Dec 81, 208p
Supersedes PB80-813736, and NTIS/PS-79/0916. See also 1964-77, NTIS/PS-79/0918.

The bibliography cites research on the economic implications of inflation. Various sectors of the economy are studied, with forecasts presented on how to deal with cost growth. Studies on foreign economies as they affect the U.S. economy are included. Many of the studies concern skyrocketing health care costs and military procurement. (This updated bibliography contains 200 citations, 43 of which are new entries to the previous edition.)

PB82-859042 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Market Segmentation. 1974-1981 (Citations from the Management Contents Data Base).
Rept. for Jan 74-Dec 81.
Dec 81, 209p
Supersedes PB81-853087.

The analysis of markets and consumer preferance is discussed in the cited reports in terms of the segmentation of various aspects of business. Included are the effects of geographical area, advertising, product line, purchasing, and available labor force. (This updated bibliography contains 299 citations, 99 of which are new entries to the previous edition.)

PB82-859547 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Real Estate Surveys, Studies, and Statistics. 1970-1981 (Citations from the NTIS Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 184p
Supersedes PB81-853079.

Citations in this bibliography cover surveys, studies, and statistics concerning private and public real estate (especially housing) on local, regional, and national scales. Economic, social, political, and environmental factors affecting the construction, buying, selling, marketing, financing, investing, and developing of real estate are addressed. The citations include case studies, housing studies, and demographic surveys. This bibliography excludes military facilities. (This updated bibliography contains 144 citations, 55 of which are new entries to the previous edition.)

5D. History, Law, and Political Science

AD-A106 835/2 PC **A11**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Legislative and Regulatory Actions Needed to Deal with a Changing Domestic Telecommunications Industry.
24 Sep 81, 237p Rept no. GAO/CED-81-136
Report to the Congress.

This report assesses the Federal Communications Commission's program for regulating domestic telecommunications common carriers. The report makes several recommendations to the Congress and the Commission for improving the regulatory framework provided by the Communications Act of 1934. Rapid technological change has broken down the natural monopoly characteristics of the telecommunications industry and paved the way for a more competitive industry structure. One contributor to this change has been the development of alternative transmission technologies--point-to-point microwave, satellites, and coaxial cable--to the traditional technology of paired wires. The size of the market for telecommunications has also grown--reflecting the convergence of data processing and telecommunications--further dismantling the natural monopoly characteristics of the industry. New equipment has been developed to provide new services such as digital networks to meet computers' specialized data transmission needs. Reacting to this technological change, the Federal Communications Commission, supported by the courts, has over the past 20 years issued a number of decisions allowing competition into the manufacture of telecommunications terminal equipment and into the interstate provision of telecommunications services, which have altered the structure of the telecommunications industry.

AD-A106 857/6 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Program Analysis Div.
Special Estate Tax Provisions for Farmers Should be Simplified to Achieve Fair Distribution of Benefits.
30 Sep 81, 100p Rept no. GAO/PAD-81-68

This report examines two provisions added to the Federal estate tax law by the Tax Reform Act of 1976 to help farm families retain farmland after the death of the owner. We made this review to determine whether the two special provisions have been effective in promoting the stated congressional objective of reducing the number of family farms sold to pay estate taxes. Information from this report was previously provided to your committees in the consideration of the Economic Recovery Tax Act of 1981. (Author)

AD-A106 879/0 PC **A07**/MF **A01**
General Accounting Office, Washington, DC. International Div.
Unresolved Issues Remain Concerning U.S. Participation in the International Energy Agency.
8 Sep 81, 137p Rept no. GAO/ID-81-38
Report by the Comptroller General.

The International Energy Agency (IEA), established in 1974 and composed of 21 oil consuming countries, is a multilateral organization designed to facilitate responses to short-term energy disruptions and long-term supply problems. IEA's Emergency Sharing System is the mechanism available to respond primarily to short-term supply interruptions. As IEA's principal proponent, the United States contributed 25 percent ($2.45 million) of the agency's budget for fiscal year 1981. The IEA serves as an energy policy coordinating forum for consuming nations. It has improved member countries' understanding of the oil market and provided them with a better sense of what needs to be done on an international and national level during a period of continuous supply uncertainty. The IEA's success in a rapidly changing market environment depends greatly on the willingness of participating countries to support its basic objectives of (1) sharing supplies in an emergency, (2) developing a comprehensive oil market information system, (3) establishing a long-term cooperation program emphasizing import controls and accelerated development and use of alternative fuels, and (4) improving consumer-producer relations. (Author)

AD-A106 899/8 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. International Div.
U.S. Role in Sinai Important to Mideast Peace.
9 Sep 81, 9p Rept no. GAO/ID-81-62

The United States has played a leading role in preserving the pease in the Sinai (the strategic peninsula directly adjacent to Israel's western border) since the 1973 war between Egypt and Israel. Through U.S. 'shuttle diplomacy,' Egyptian and Israeli forces were separated with buffer zones between them. Then in 1976, the United States established a civilian tactical early warning system in the strategic mountain passes of the Sinai to monitor adherence to the terms o the Sinai agreements. The United States, as a result of the current peace treaty between Israel and Egypt, will deploy armed forces in the Sinai as part of a multinational peacekeeping force to supervise implementation of the treaty. This deepening U.S. involvement in the Sinai is crucial to the peace process, but also raises serious issues for congressional consideration. (Author)

AD-A106 927/7 PC **A02**/MF **A01**
Department of State, Washington, DC. Office of External Research.
Saudi Perceptions of the International Environment,
William B. Quandt. 22 Sep 81, 4p FAR-211-GP

Saudi Arabia enters the 1980s with unprecedented wealth and international prestige. This does not, however, produce a sense of real power or security on the part of Saudi rulers. The reasons are several: In terms of population and military might, Saudi Arabia remains a small power by Middle East standards. Regional instability threatens Saudi Arabia directly and indirectly. The US-Saudi relationship, long relied upon by Saudi leaders to enhance the KIngdom's security, is being called into question. The Soviet Union is developing positions of strength around Saudi Arabia--Afghanistan, South Yemen, Ethiopia, as well as Libya and Syria.

AD-A106 930/1 PC **A02**/MF **A01**
Department of State, Washington, DC. Office of External Research.
Saudi Arabia: The Flexibility of Islamic Fundamentalism,
John L. Esposito. Sep 81, 7p FAR-213-GP

Saudi Arabia has long provided the classic modern example of an Islamic state. The Saudis proudly proclaim and their history and practice seem to have confirmed its Islamic character.

AD-A107 113/3 PC **A02**/MF **A01**
Department of State, Washington, DC. Office of External Research.
Pakistan's Foreign Relations,
Shirin Tahir-Kheli. Oct 81, 6p FAR-212-GP
Prepared in cooperation with Temple Univ., Philadelphia, PA, and Foreign Policy Research Inst., Philadelphia, PA.

The 'Islamic connection' and relations with the People's Republic of China are the two constants of Pakistan's foreign policy. Historically, common perceptions of threat have been instrumental in bringing nations together, and so it is with the PRC and Pakistan which, since the 1960s, have shared their fear of India and the Soviet Union. The Indo-Soviet treaty of 1971 institutionalized the links between the two signatories and left little doubt in Islamabad and Beijing that parallel interests had brought Moscow and New Delhi into a treaty relationship.

AD-A107 482/2 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Cooperative Extension Service's Mission and Federal Role Need Congressional Clarification.
21 Aug 81, 58p Rept no. GAO/CED-81-119
Report to the Congress.

The Cooperative Extension Service has expanded into new and more socially oriented programs from its original focus on agriculture and home economics programs in primarily rural areas. As demands for its services have increased, disagreements have arisen over what its mission should be. The U.S. Department of Agriculture's role in providing overall program leadership and guidance and in evaluating extension activities is also not clear. Because the Extension Service's resources are limited ($700 million in 1980) and demands for its services are increasing. GAO recommends that appropriate congressional committees examine the Cooperative Extension Service's mission, including the appropriate Federal role. (Author)

AD-A107 483/0 PC **A03**/MF **A01**
Joint Chiefs of Staff, Washington, DC.
Soviet News and Propaganda Highlights from 'Red Star' (The Official Newspaper of the Soviet Defense Establishment) for the Period 1-31 July 1981.
1981, 41p

Contents: Soviet Perceptions of International Events -- United States (U.S. Military/Political Hegemony, The Arms Race, Foreign Military Assistance, and Other Themes), Poland, Israel--The Attack on Lebanon, Chain, Afghanistan, Japan, and United Kingdom; Coverage of the Soviet Union -- Allocation of Major Subjects, Allocation of Soviet Military Themes, and Examples of Selected Critical Coverage of Various Topics; Appendix A -- A Selection of Propaganda Cartoons.

AD-A107 484/8 PC **A03**/MF **A01**
Joint Chiefs of Staff, Washington, DC.
Soviet News and Propaganda Analysis from 'Red Star' (The Official Newspaper of the Soviet Defense Establishment) for the Period 1-31 August 1981. Volume 1. Number 8, 1981.
1981, 46p

Contents: Soviet Perceptions of International Events -- United States (The Arms Race, U.S. Military/Political

Hegemony, and Foreign Military Assistance and Mutual Security), Poland, Afghanistan, Japan, China, and South Africa--Angola; Soviet Domestic and Military Subjects -- The Soviet Military, Examples of Selected Critical Coverage of Various Topics; and Appendix -- A Selection of Propaganda Cartoons.

DE82000170 PC **A03**/MF **A01**
Argonne National Lab., IL.
Inferred Referendum and Its Comparison with Borda Voting.
A. M. Wolsky, and L. P. Sanathanan. May 80, 40p
ANL/SPG-19
Contract W-31-109-ENG-38

A new amalgamation procedure or method of social choice, the inferred referendum, is presented and compared with Borda voting. The procedure has an unrestricted domain and satisfies the principles of unanimity, anonymity, and neutrality. The procedure agrees with majority voting, MMD, when MMD is transitive. When MMD is intransitive, the inferred referendum orders the alternatives through the solution of a constrained maximum-likelihood problem. This problem is the same as one would solve to infer the beliefs of a transitive population from a random sample. If, in fact, the decision makers represent a constituency, attention must also be given to a figure of merit whose value might indicate when to defer action based on the result of the inferred referendum. A different amalgamation procedure, Borda voting, is described as a simple example of a large class of natural procedures. Each of these procedures is shown to have two associated quantities that together generalize Kendall's coefficient of concordance, W; the relation of this coefficient to pairwise votes, and thus to MMD and Borda voting, is also described. A detailed comparison of Borda voting and the inferred referendum is given for the case of three alternatives. In that case, the procedure depends only on pairwise votes, where the two procedures differ is shown, the procedure violates Sen's property alpha less than does Borda's, and the maximum value of W for which MMD can be intransitive and the maximum value of W for which the inferred referendum, MMD, and Borda voting can differ are found. (ERA citation 06:035762)

N82-11989/2 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.
E. D. Gaggero, and R. P. Ripoll. Sep 81, 35p NASA-TM-76730
Contract NASW-3541
Transl. Into English from Mcgill Univ. Ann. Of Air and Space Law (Canada), V. 5, 1980 p 449-480. Transl. By Kanner (Leo) Associates, Redwood City, Calif. Original DOC. Prep. By Montevideo Univ., Uruguay.

The treaty on the Moon is not revolutionary but it embodies the legal rule for future activities of man on the Moon as opposed to the Space Treaty of 1967 which was too general. The new text is conservative but still allows some room for the developing States as in the law of the sea. The Moon is declared the 'Common Heritage of Mankind' but the regime of exploitation of its resources is still blurred with imprecise guidelines still needing to be developed. The two superpowers cannot as in the past, ignore the rest of the world in the conquest of space and the fact that the U.N. is the depositary for ratifications, and not the two superpowers as in previous treaties, is the first sign of wider participation in the creation of Space Law.

PB82-134198 PC **A06**/MF **A01**
Abt Associates, Inc., Cambridge, MA.
An Analysis of the Scope of Federal Laws and Regulations Controlling Exposures to Substances Which Cause Occupational Respiratory and Pulmonary Diseases.
Final rept. Sep 78-Dec 79,
Philip Tabas, Gene E. Fax, and Michael B. Phillips. Dec 79, 108p ASPER/CON-78/0153/A
Contract DL-J-9-M-8-0153

This report presents the findings from a study of the scope of laws and regulations covering pulmonary and respiratory hazards. The analytic approach consisted of first developing a basic inventory of relevant regulated substances, then determining the range of toxic effects regulated, and finally identifying the range of work place settings covered by the regulations. Each substance listed in the inventory was assigned a hazard status and a regulatory status. No attempt was made to assess the enforcement or the degree of compliance with the laws and regulations. The analysis revealed that: (1) worker exposures to substances whose toxic effects are known to cause cancer and chronic respiratory illness are for the most part governed by regulations which are fully in effect; (2) this is largely the result of the consensus standards adopted en bloc early in OSHA's history rather than standards adopted on a substance by substance basis; (3) less than half of all known exposures to substances with presumed (as opposed to known) toxic effects are governed by regulations fully in effect; and, (4) although there is no significant duplication among regulations, there is fragmentation of effort among the administering agencies.

PB82-859455 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Political Aspects of Energy Policy. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 269p
Supersedes PB81-856023. Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography covers the political aspects or ramifications of national and international energy policies in general, and to specific energy sources, supplies, conservation, and technology in particular. Public opinion of social and economic impacts and implications of energy policies are also considered. (This updated bibliography contains 269 citations, 127 of which are new entries to the previous edition.)

5E. Human Factors Engineering

AD-A107 296/6 PC **A04**/MF **A01**
Army Research Inst. for the Behavioral and Social Sciences, Alexandria, VA.
Communications Intelligence: Transcriber Output Enhancement.
Research rept. May 78-Jun 79,
Harold Martinek, Edgar M. Johnson, and Thomas E. Jeffrey. Sep 80, 67p Rept no. ARI-RR-1268

A workflow model of major transcriber functions was developed and time data for these functions were collected on 52 operational personnel. A time analysis was performed with respect to individual functions and logical sets of functions for a representative sample of the operationally meaningful groups of transcribers. The time analysis of transcriber functions indicated that about one-third of productive time was spent in the Listen, Rock, and Search functions and another one-third in doing these functions in conjunction with others. About 11% of the transcribers' time was spent in obtaining help from reference material, 5% in the tape changing functions, and 8% in team work functions. Differences clearly existed between organizational groups in the time spent on specific transcriber functions. Development of procedures to enable transcribers to exploit digitization and computer storage of taped communications should improve productivity at least 10% to 20% by eliminating search and tape changing functions, by reducing time spent in getting help from reference material and other transcribers and in giving help, and improving exploitation of source material. (Author)

AD-A107 515/9 PC **A04**/MF **A01**
HRB-Singer, Inc., State College, PA.
Experimental Investigation of Near Real-Time Interpretation Techniques for Transmitted Imagery.
Final rept.,
Thomas E. Ray, Robert B. King, and Marshall A. Narva. Aug 80, 52p ARI-RN-80-24
Contract DAHC19-71-C-0031

Eight interpretation concepts such as might be utilized at a ground terminal in conjunction with the handling of transmitted imagery were simulated. Four were one-man concepts while the other utilized two-man teams viewing the imagery in sequence. The one-man concepts were formulated around different combinations of the elements of availability of film speed control, and the decision criteria for the initial man of the team and the associated rescreening strategy of the second man of the team. Military image interpreters detected, identified, and reported targets on the imagery, presented on motorized light table under two film input rates, utilizing the conditions of the various experimental interpretation concepts. Interpretation performance was found to be influenced by the size of the viewing area and the use of a magnifying reticle to localize targets, in the one-man concepts. The incorporation of the speed control option did not significantly affect performance. Provision for control of film movement or differential emphasis on accuracy or completeness had no significant effects in the two-man concepts. (Author)

5F. Humanities

AD-A107 143/0 PC **A07**/MF **A01**
Mississippi Univ., University. Center for Archaeological Research.
Excavation of Eleven Archaic and Woodland Sites in the Divide-Cut Section of the Tennessee-Tombigbee Waterways, Tishomingo County, Mississippi.
Final rept.,
Kenneth M. Binkley. Sep 78, 131p
Contract DACW61-76-C-0192

Eleven aboriginal sites were excavated to mitigate the data loss from the effects of construction in the Divide-Cut Section of the Tennessee-Tombigbee Waterway. Site descriptions, field methods employed and descriptions of material recovered are presented. Two contrasting sets of sites based upon two physiographic variables are discussed. Assemblage-level comparisons are made between sites lying north or south of Tennessee Valley Divide, and between sites located on bottoms of terraces. Results of these comparisons suggest that sites located north and south of the Divide are not significantly different and sites located on terraces are oriented more toward lithic tool production than are bottom sites. Temporal utilization, based upon projectile point typology, is shown for the ten sites which yielded projectile points. (Author)

AD-A107 151/3 PC **A08**/MF **A01**
Water and Air Research, Inc., Gainesville, FL.
Cultural Resources Investigations at Redstone Arsenal, Madison County, Alabama. Volume I.
Report of investigations no. 35 (Final) 1979-1981,
Prentice M. Thomas, Jr., Jeffrey H. Altschul, K. Bagley-Baumgartner, L. Janice Campbell, and D. Bruce Dickson, Jr. 1980, 175p
Contract DACW01-79-C-0024
Prepared in cooperation with New World Research, Inc., Pollock, LA. See also Volume 2, AD-A107 152.

A reconnaissance level cultural resources survey and program of testing and evaluation in the proposed alternate corridor of the DDT Contamination Study, Wheeler Resorvoir, Redstone Arsenal, Alabama, resulted in the identification of 22 new sites and the testing of 26 previously recorded or newly discovered sites. The program of testing and evaluation was augmented by deep-testing to determine the area's geomorphic history and to assess the possible presence of buried sites. No buried sites were encountered; however, the testing program and subsequent analysis identified occupation in the study corridor from the Paleo-Indian through the Historic Period. A predictive model of site location, based on environmental variables, was formulated and resulted in the determination of high, medium, and low probability areas for site occurrence. (Author)

AD-A107 152/1 PC **A17**/MF **A01**
Water and Air Research, Inc., Gainesville, FL.
Cultural Resources Investigations at Redstone Arsenal, Madison County, Alabama. Volume II.
Report of investigations no. 35,
Prentice M. Thomas, Jr., Jeffrey H. Altschul, K. Bagley-Baumgartner, L. Jancie Campbell, and D. Bruce Dickson, Jr. 1980, 392p
Contract DACW01-79-C-0024
Prepared in cooperation with New World Research, Inc., Pollock, LA. Includes envelope with map. See also Volume 1, AD-A107 151.

For abstract see AD-A107 151.

AD-A107 171/1 PC **A14**/MF **A01**
Alabama Univ., University. Office of Archaeological Research.

Archaeological Investigation in the Gainesville Lake Area of the Tennessee-Tombigbee Waterway. Volume IV. Biocultural Studies in the Gainesville Lake Area.
Investigations rept. no. 14,
Gloria May Caddell, Anne Woodrick, and Mary C. Hill. 1981, 312p
Contract DACW01-76-C-0120

This report describes the botanical remains analyzed from five sites, 1Gr1X1 1Gr2, 1Gr50, 1Pi61, and 1Pi33, located in Greene and Pickens Counties, Alabama, in the central Tombigbee River Valley. These five sites were excavated during 1976 and 1977 and, when taken together, represent most of the 12,000 year prehistory of the region. The 1976 and 1977 seasons at these sites marked the first time that a large sample of botanical remains from the area was systematically recovered, identified, and enumerated. In contrast, previous work utilized small samples from a few features, unsystematic recovery techniques, or failed to quantify the botanical remains. It nevertheless provided a starting point for this study, furnishing information on prehistoric plant use in the area. The previous research shows a reliance on wild plant resources from Archaic times through to the Mississippian stage, when cultivated plant remains form a large proportion of those identified. (Author)

AD-A107 172/9 PC **A12**/MF **A01**
Mississippi State Univ., Mississippi State. Dept. of Anthropology.
Archaeological Salvage Excavations at the Tibbee Creek Site (22Lo600) Lowndes County, Mississippi.
Final rept.,
John W. O'Hear, Clark Larsen, Marge M. Scarry, John C. Phillips, and Erica Simons. Jun 81, 265p
Contract DACW01-77-C-0015

This multicomponent site was located on Tibbee Creek in the floodplain of the Tombigbee River, at the western edge of the floodplain. Archaeological components ranging from the early portion of the Gulf Formational stage at approximately 1000 B.C. through the Mississippian stage dating about A.D. 1200 were present at the site. The indications are that the site locale functioned as a transitory camp during the Gulf Formational stage as well as through the later Miller I and II phases of the Middle Woodland period. The most intensive occupation of the site occurred during the late Woodland Miller III phase. Two house structures, several burials, and a large number of cooking/storage pits associated with the Miller III component were found during the excavations. The indications are that the site functioned as a base camp during Miller III. The final prehistoric component present at the Tibbee Creek site was a Mississippian farmstead which is assignable to the Lyon's Bluff phase and is closely aligned with the Moundville phase. Major features of this Mississippian component are a large wall trench house with 72 sq m of floor area, a group of 11 burials, nine of which were in a planned cemetery, and a number of ancillary pit features.

N82-11514/8 PC **A03**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Radar Mapping, Archaeology, and Ancient Land Use in the Maya Lowlands.
R. E. W. Adams, W. E. Brown, Jr., and T. P. Culbert. 31 Mar 81, 27p NASA-CR-164931
Contract NAS7-100

Data from the use of synthetic aperture radar in aerial survey of the southern Maya lowlands suggest the presence of very large areas drained by ancient canals for the purpose of intensive cultivation. Preliminary ground checks in several very limited areas confirm the existence of canals and raised fields. Excavations and ground surveys by several scholars provide valuable comparative information. Taken together, the new data suggest that Late Classic period Maya civilization was firmly grounded in large-scale and intensive cultivation of swampy zones.

PB82-109364 PC **A08**/MF **A01**
Nevada Univ., Las Vegas. Archaeological Research Center.
Project Lame 80F: A Cultural Resource Survey Around Boulder Beach, Echo Bay, Temple Bar and Cottonwood Cove in the Lake Mead National Recreation Area Clark County, Nevada and Mohave County, Arizona,
Richard H. Brooks, Robert R. Ellis, and Kathleen Bergin. Jun 81, 152p 1-2-11, NPS/WAC-81/18
NPS-CX-8100-0-0008

The prehistoric and historic archeological resources located by an intensive survey of four marinas at Lake Mead National Recreation Area, Boulder Beach, Echo Bay, Temple Bar, and Cottonwood Cove, are described in this report. A total of 6.25 square miles were surveyed, and 16 new archeological resources were added to 10 others that had been identified by previous investigations. The report concludes that many of the cultural activities prior to 1940 are related to a transient demographic pattern caused by exploiting geological resources. Aboriginally this is expressed by large lithic quarries and mining areas. Historically, it is expressed by subsequent mining and the development of Hoover Dam.

PB82-109422 PC **A16**/MF **A01**
ESCA-Tech Corp., Costa Mesa, CA.
Architectural and Historical Survey on Approximately 121,265 Acres in Central North Dakota.
Final rept. Sep 79-Jun 81,
Dennis J. Staff, and William E. Reynolds. Jun 81, 365p
DI-9-07-06-V0030

The report contains the results of an architectural and historic site survey as part of the Garrison Diversion Unit in central North Dakota. The areas surveyed include the Lonetree Reservoir, New Rockford Canal, James River Feeder Canal, James River Improvement, La Moure area, New Rockford area, East Oakes area and West Oakes area. A total of 144 historic sites were recorded on 121,265 acres of land. The report contains extensive archival research of land ownership data, a discussion of the history of central North Dakota, a brief description of each site, and a discussion/comparison of the architecture in the various areas.

PB82-138215 PC **A07**/MF **A01**
Science Applications, Inc., McLean, VA.
A Cultural Resource Survey of the Continental Shelf from Cape Hatteras to Key West. Volume I: Introduction and Physical Environment.
Final rept.
Jun 81, 149p BLM/YL/ES-81/05
Contract DI-AA551-CT8-40
See also Volume 2, PB82-138223.
Also available in set of 4 reports PC E17, PB82-138207.

This study was designed to develop models to predict the location of unknown cultural resources on the Southeastern United States Continental Shelf. These unknown cultural resources stem from the lack of reliable evidence of human prehistoric occupation. The report contains a section on the executive summary and a discussion on physical environment with reference to geology, late pleistocene climatology, late pleistocene paleontology, and holocene climatology.

PB82-138223 PC **A06**/MF **A01**
Science Applications, Inc., McLean, VA.
A Cultural Resource Survey of the Continental Shelf from Cape Hatteras to Key West. Volume II: Prehistoric Archaeology.
Final rept.
Jun 81, 117p BLM/YL/ES-81/06
Contract DI-AA551-CT8-40
See also Volume 1, PB82-138215, and Volume 3, PB82-138231.
Also available in set of 4 reports PC E17, PB82-138207.

This study was designed to develop models to predict the location of unknown cultural resources on the Southeastern United States Continental Shelf. The report contains a section on prehistoric archaeology with reference to culture history, paleoenvironment, and a predictive model.

PB82-138231 PC **A07**/MF **A01**
Science Applications, Inc., McLean, VA.
A Cultural Resource Survey of the Continental Shelf from Cape Hatteras to Key West. Volume III: Appendices.
Final rept.
Jun 81, 127p BLM/YL/ES-81/07
Contract DI-AA551-CT8-40
See also Volume 2, PB82-138223, and Volume 4, PB82-138249.
Also available in set of 4 reports PC E17, PB82-138207.

This study was designed to develop models to predict the location of unknown cultural resources on the Southeastern United States Continental Shelf. The report lists appendices for civil war shipwreck of the first Charleston 'Stone Fleet', civil war shipwrecks of the second Charleston 'Stone Fleet', shipwrecks of the 1715 Flota off the Florida Coast, and shipwrecks of the 1733 Flota. It includes an inventory of lighthouses along the South Atlantic Coast, and a list of major institutional sources of published and unpublished data related to historical cultural resources on the Southern outer continental shelf, and shipwreck compendium.

PB82-138249 PC **A04**/MF **A01**
Science Applications, Inc., McLean, VA.
A Cultural Resource Survey of the Continental Shelf from Cape Hatteras to Key West. Volume IV: Conclusions and Recommendations.
Final rept.
Jun 81, 67p BLM/YL/ES-81/08
Contract DI-AA551-CT8-40
See also Volume 3, PB82-138231.
Also available in set of 4 reports PC E17, PB82-138207.

This study was designed to develop models to predict the location of unknown cultural resources on the Southeastern United States Continental Shelf. The report contains a section on the executive summary, conclusions to physical environment, prehistoric archaeology, and shipwreck archaeology, and recommendations for the management of archaeological resources on the Continental Shelf.

PB82-140351 PC **A13**/MF **A01**
National Park Service, Denver, CO. Branch of Historic Preservation.
Historic Resource Study and Historic Structure Report Ninety Six: A Historical Narrative,
Jerome A. Greene. Nov 79, 297p FNP-560-82-02

The report discusses the significance of Ninety Six National Historic Site in South Carolina. One theme is the prominence of the village in the political, economic, and social development of colonial backcountry South Carolina during the 18th century. The other theme is based on the town's role in the American Revolution, first as a center of regional political dissension and later as a focal point of British hegemony in South Carolina resulting in the Siege of Ninety Six by General Nathanael Greene's command in May and June, 1781. The study recounts the beginnings of Ninety Six with the Indian occupation to its decline in the early 1800's. The majority of the text concentrates on the establishment of the military post at Ninety Six by the British and General Greene's siege on the fort. The report concludes with a brief synopsis of its establishment as a National Historic Site.

5H. Man-Machine Relations

AD-A107 442/6 PC **A04**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Effect of Task Duration on Voice Recognition System Performance.
Technical rept.,
J. w. Armstrong, and Gary K. Poock. Sep 81, 71p
Rept no. NPS55-81-017

This report describes an experiment examining voice recognition performance when subjects were required to make a decision every 1.5 seconds for 20 consecutive minutes while speaking to a voice recognizer at the same time. Results showed mental loading degraded voice recognition performance. Results also showed performance degradation similar to a vigilance decrement over eight trials of 2.5 minutes each. (Author)

AD-A107 444/2 PC **A02**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Enhancing Technology Transfer of Computer Hardware and Software Architectures Using Human Factors in Initial Design.
Technical rept.,
Gary K. Poock, and Ronald J. Roland. Sep 81, 21p
Rept no. NPS55-81-019

This paper describes an experiment which attempted to subjectively measure the transfer of technology directly from the research arena to operational application. Areas of technology included recently developed computer software 'natural languages' based on artificial intelligence (AI) concepts, computer networking technology and automatic message handling systems. Exposure to this technology was accomplished over a 12 week period where the experimental group was provided with the tools and understanding to use the various research products. Data were collected from this experimental group prior to and after the 12 week period. Analysis of the data revealed interesting aspects concerning a user's perception of the value or utility of computer systems and computer software designed specifically to enhance the human-system interaction. (Author)

5I. Personnel Selection, Training, and Evaluation

AD-A106 819/6 PC **A02**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Systems and Logistics.
Effect of Work Schedule, and Description of Career Intention on Organizational Effectiveness.
Technical rept.,
William H. Hendrix, and Nestor K. Ovalle. Aug 81, 16p Rept no. AU-AFIT-LS-5-81

Research was conducted to establish the effects of work schedule and description of career intention on three criteria of effectiveness (i.e., climate, satisfaction, and perceived productivity). Data were collected on 4786 military and civilian personnel located at five Air Force bases using the Organizational Assessment Package (OAP). Two separate one-way ANOVA's were used to test for differences between different work schedules and differences between individuals' descriptions of career intentions. Work schedules differed significantly with the category of 'daily work only' having higher values on the three criteria while 'swing shift' had the lowest values. Those planning to continue in the Air Force had the highest scores on all three criteria. (Author)

AD-A106 820/4 PC **A02**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Systems and Logistics.
Effect of Number Supervised and Educational Level on Organizational Effectiveness.
Technical rept.,
William H. Hendrix, and Nestor K. Ovalle. Aug 81, 20p Rept no. AU-AFIT-LS-6-81

Research was conducted to establish the effects of number of people directly supervised and highest educational level obtained on three criteria of effectiveness (i.e., climate, satisfaction, and perceived productivity). Data were collected on 4786 military and civilian personnel located at five Air Force bases using the Organizational Assessment Package (OAP). Two separate one-way ANOVA's were used to test for differences between the number of people directly supervised by subjects and differences associated with the highest educational level obtained. Number of people supervised differed significantly with larger numbers supervised having higher values on all three criteria. Educational levels differed significantly on the criteria with high school graduates reporting lower values for climate and job satisfaction while doctoral degree subjects reported the lowest values for perceived productivity. (Author)

AD-A106 831/1 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Controller Staffing and Training at Four FAA Air Traffic Control Facilities.
9 Jul 81, 41p Rept no. GAO/CED-81-127

GAO's review of air traffic controller staffing, at the Chicago O'Hare and Denver Stapleton Airports and at the Chicago and Denver enroute traffic control centers indicated staffing level problems only at O'Hare. Some problems with controller training were noted at each facility. FAA is taking steps to alleviate the staffing problem at O'Hare and to correct some of the training problems. GAO also found no correlation between aircraft accidents or violations of FAA's separation standards for aircraft and controller staffing level or training. (Author)

AD-A106 842/8 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Federal Personnel and Compensation Div.
Tightening Eligibility Standards Could Cut Involuntary Retirement Costs by Millions of Dollars.
25 Sep 81, 10p Rept no. GAO/FPCD-81-71

OPM needs to tighten the eligibility criteria for early retirements to avoid unwarranted separations and reduce costs. Hundreds of unwarranted involuntary retirements are occurring because current OPM policy permits employees to decline reasonable offers of other positions and retire early. The involuntary retirement program needs to be restructured to prohibit early retirements when an agency extends to the employee whose position is to be abolished a reasonable offer of another position. Restructuring the program would serve a twofold purpose by (1) retaining experienced employees who are retiring prematurely, and (2) reducing outlays from the civil service retirement fund. (Author)

AD-A106 843/6 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Federal Personnel and Compensation Div.
Serious Problems Need to be Corrected before Federal Merit Pay Goes into Effect.
11 Sep 81, 26p Rept no. GAO/FPCD-81-73
Report to the Congress.

This report was prepared in response to a request from the Chair, Subcommittee on Compensation and Employee Benefits, House Committee on Post Office and Civil Service. It points out that problems with merit pay implementation could cause program failure unless immediate action is taken. These problems were identified earlier when GAO testified before the Subcommittee on July 21, 1981. As a result of the merit pay hearings, the Subcommittee requested that the President of the United States take action to prevent Federal agencies from implementing faulty pay-for-performance systems. The actions requested by the Subcommittee are similar to the recommendations contained in this report. (Author)

AD-A106 844/4 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Federal Personnel and Compensation Div.
Recruiting Malpractice: Extent, Causes, and Potentials for Improvement.
20 Jul 81, 56p Rept no. GAO/FPCD-81-34
Report to the Honorable Sam Nunn, Member, Committee on Armed Services.

This report is based on a questionnaire survey of Armed Forces recruiting personnel in all services--Active, National Guard, and Reserve. Survey results show the perceptions of recruiters, noncommissioned officer supervisors, and commanding officers on the extent of malpractice within the respective service recruiting programs; possible causes for these actions; and probable corrective actions. GAO made this study in response to a request of Senator Sam Nunn, while Chairman of the Subcommittee on Manpower and Personnel, Senate Committee on Armed Services, who was concerned about the adequacy of service actions to control malpractice. Investigations in 1978 and 1979 determined that recruiting malpractice problems did occur in the Marine Corps and the Army. Overall, GAO surveyed personnel in seven separate recruiting programs. The highest perceived level of malpractice is within the Marine Corps program, followed in descending order by the Army, Army National Guard, Navy, Air Force, Air Force Reserve, and Air National Guard.

AD-A106 845/1 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Veterans Administration Education Loan Program Should be Terminated: Legislative Action Taken.
28 Aug 81, 15p Rept no. GAO/HRD-81-128

Public Law. No. 95-476 provided additional authority to limit program participation to veterans attending high-cost schools. With the strengthening of the criteria used in defining allowable expenses for determination of financial need, loans awarded decreased from 28,908 in fiscal year 1978 to 7,761 in fiscal year 1980--a significant drop in program participation. Furthermore, the dollar value of loans disbursed dropped from $35.8 million to $6.7 million. A VA study notes that about 50 percent of the reduction appeared attributable to the new guidelines. Although overall program administration improved as a result of these changes, VA continued to experience severe problems with loan defaults. According to VA data, the cumulative loan default rate increased from 44 percent as of December 31, 1977, to 65 percent as of September 30, 1980. The default rate on matured loans for fiscal year 1980 was even higher--81 pecent.

AD-A106 847/7 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Department of Labor Needs to Give CETA Prime Sponsors More Guidance and Assistance for Implementing Monitoring Requirements.
3 Sep 81, 8p Rept no. GAO/HRD-81-136

Section 121 of the CETA Amendments of 1978 required each prime sponsor to establish an independent unit for monitoring compliance with the act, the regulations issued thereunder, and the prime sponsor's comprehensive employment and training plan. The Secretary of Labor was required to annually assess the effectiveness of these units, particulary the adequacy of provisions made for funding, staffing, and insuring the independence and objectivity of monitoring practices and methods. Our overall objective was to assess Labor's and prime sponsors' implementation of the monitoring requirements. In this regard, we concentrated on IMU staffing, training, and monitoring activities since the 1978 amendments were enacted. To accomplish our objective, we examined the status and operations of IMUs in fiscal year 1980 at the New Bedford Consortium, New Bedford, Massachusetts; Balance of State of Maine, Augusta, Maine; and Balance of State of New Hampshire, Concord, New Hampshire. Our work focused on the IMUs' staffing and organization, monitoring procedures, and results achieved. In assessing the results, we compared the prime sponsors' progress in implementing the IMU concept with Labor criteria. We interviewed officials and reviewed records and documentation at Labor's national office, the Region I office, and the prime sponsors. In addition, we assessed the region's oversight role relating to IMUs at the three prime sponsors. (Author)

AD-A106 861/8 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Delays in Receiving and Investing Taxes are Reducing Railroad Retirement Program Interest Income.
24 Sep 81, 25p Rept no. GAO/HRD-81-112

In recent years the financial stability of the Account has been seriously impaired. The Board predicts that it may not be able to pay total benefits by 1982. Because of this, we sought to determine how more timely tax deposits could improve the programs's cash flow. Since this study began, the Congress has passed the Omnibus Budget Reconciliation Act of 1981 which contains provisions dealing with railroad retirement's financial problems. We have examined these provisions and found that they did not included the matters discussed in this report. Even if the legislative provisions improve the financial outlook for the Account, we believe that it is in the best interest of the program to maximize interest earnings to the Account. Our work was conducted primarily at the Board's headquarters in Chicago, Illinois. We reviewed the legislative history of certain sections of the Railroad Retirement Act, as amended; interviewed officials of the Board, the Treasury, and the Internal Revenue Service (IRS); interviewed representatives of several railroads selected at random; and reviewed and analyzed pertinent agency records. The Board, Treasury, and the Association of American Railroads (AAR) reviewed and commented in writing on a draft of this report. We incorporated their comments where appropriate and the text of each agency's comments is in appendixes I through III. In estimating the additional interest income which could have been earned with more frequent deposit requirements, we used the taxable payroll totals railroads reported to the Board and applied the appropriate tax rates to determine payroll taxes paid for fiscal years 1978-80.

AD-A106 865/9 PC **A04**/MF **A01**
University of Southern California, Los Angeles. Center for Effective Organizations.
An Appraisal of Performance Appraisal Summary Results of a Large Scale Study.
Interim rept.,

Susan Resnick, and Monty Mohrman. May 81, 53p
81-5(11), 1, AD-E001 182
Contract N00014-81-K-0048

The results of an organizational study of performance appraisal are reported. The study documented performance appraisal objectives, beliefs and assumptions described and evaluated the company's performance appraisal system; and made recommendations regarding performance appraisal practice. On site interviews, questionnaires, and personnel records served as data sources. Over 2000 superior/subordinate pairs responded to questionnaires. Analysis of the data revealed importances between supervisors and subordinates about objectives of personnel performance appraisal. In addition, the two groups had different beliefs and assumptions about performance appraisal.

AD-A106 867/5 PC **A03**/MF **A01**
Minnesota Univ., Minneapolis. Computerized Adaptive Testing Lab.
A Validity Comparison of Adaptive and Conventional Strategies for Mastery Testing.
Research rept.,
G. Gage Kingsbury, and David J. Weiss. Sep 81, 35p
RR-81-3, AD-E001 183
Contract N00014-79-C-0172

Conventional mastery tests designed to make optimal mastery classifications were compared with fixed-length and variable-length adaptive mastery tests in terms of validity of decisions with respect to an external criterion measure. Comparisons between the testing procedures were made across five content areas in an introductory biology course from tests administered to over 400 volunteer students. The criterion measure used was the student's final standing in the course based on course examinations and laboratory grades. Results indicated that the adaptive test resulted in mastery classifications that were more consistent with final class standing than those obtained from the conventional rest.

AD-A106 874/1 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Limits on Receipt of Multiple Disability Benefits Could Save Millions.
28 Jul 81, 18p Rept no. GAO/HRD-81-127
Report to the Chairman, Committee on Finance, United States Senate.

In performing our review, we determined that about 4,900 Federal, State, and local programs include disability benefits. Forty-five of these programs are administered by the Federal Government. We defined Federal disability programs as those exempt from the Employee Retirement Income Security Act or those supported by tax revenue. During fiscal year 1980, these Federal programs paid over $37 billion in benefits to over 11 million beneficiaries. The most recent data on the State or local programs gathered by the Bureau of the Census in 1977 showed that for 3,075 State and local government benefit programs about 152,000 persons were receiving annual disability benefits of about $600 million. Data were not available on the other State and local programs. A sample of 11,669 DI recipients on the rolls as of March 1980 was matched against the disability rolls of the 8 largest Federal retirement systems, 12 large State and local government retirement systems, and the workers' compensation programs of the States and territories. The programs matched represented about 98 percent of the total Federal beneficiaries and about 38 percent of the total State and local government beneficiaries. The results showed that 1,913 (about 16 percent) of the DI beneficiaries also received benefits from one or more of the matched programs. About 41 percent of these beneficiaries received aggregate benefits exceeding their predisability earnings. (Author)

AD-A106 877/4 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Information on Funding Commitments from Comprehensive Employment and Training Act Titles III and IV during Fiscal Year 1981.
31 Aug 81, 75p Rept no. GAO/HRD-81-146

Our objective was to answer specific questions relating to (1) whether, and to what extent, procedures used by Labor for awarding grants and contracts with CETA titles III and IV discretionary funds violated Federal rules, regulations, and requirements and (2) how discretionary funds under CETA titles III and IV were and are used; i.e., the type and extent of awards. The detailed information obtained on these questions is contained in both appendixes. (Author)

AD-A106 889/9 PC **A06**/MF **A01**
President's Task Force on Aircraft Crew Complement, Washington, DC.
Report of the President's Task Force on Aircraft Crew Complement,
John L. McLucas, Fred J. Drinkwater, III, and Howard W. Leaf. 2 Jul 81, 107p

The President's Task Force on Aircraft Crew Complement: (1) Reviewed the August 1980 decision by the Federal Aviation Administration to certify the McDonnell Douglas DC-9-80 aircraft for operation by a minimum of two persons; and (2) made recommendations concerning the use of two-member crews in the proposed Boeing 757 and 767 and other 'new generation' commercial jet aircraft. Principal conclusions of the Task Force are: Operation of the DC-9-80 by a crew of two is safe and the FAA's certification of the DC-9-80 for operation by a minimum crew of two was proper and in compliance with the Federal Aviation Act. (Author)

AD-A106 912/9 Not available NTIS
Naval Medical Research and Development Command, Bethesda,MD.
Comparisons of Performance Effectiveness Among Divers,
Robert J. Biersner, Mark L. Dembert, and Mark D. Browning. 1980, 4p
Availability: Pub. in Aviation, Space, and Environmental Medicine, v51 n11 p1193-1196 Nov 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A106 939/2 PC **A05**/MF **A01**
Training Analysis and Evaluation Group (Navy), Orlando, FL.
Preparation and Design for a Training Effectiveness Evaluation of Device 2F64C for Replacement Pilot Training,
Robert F. Browning, William C. McDaniel, and Paul G. Scott. Aug 81, 98p Rept no. TAEG-108

This report presents the initial effort in a program to assess the training potential of a new simulator (Device 2F64C) for training SH-3 replacement helicopter pilots. The report provides an account of the work accomplished and the preparations for assessing the device when ready-for-training. The report contains: A description of the training situation at the fleet readiness squadron prior to and during the transition to a new curriculum which resulted from an instructional system development (ISD) program: A discussion of TAEG's initiatives to enhance the training of replacement helicopter pilots: A discussion of the factors impacting on syllabi content and the process used in developing syllabi for assessing the training effectiveness of Device 2F64C: A description of the detailed scenarios developed to ensure effective implementation of a syllabus designed to realize the maximum potential of the new device: The outline of an experimental plan for assessing the training effectiveness of Device 2F64C. (Author)

AD-A106 995/4 PC **A03**/MF **A01**
Navy Personnel Research and Development Center, San Diego, CA.
Mathematics Curricula Requirements and Performance Levels in Navy Class 'C' Electronics Schools.
Technical rept. 1 Dec 79-1 Jun 80,
Meryl S. Baker. Oct 81, 37p Rept no. NPRDC-TR-82-4
See also Rept. nos. NPRDC-TR-81-4, NPRDC-TR-81-2 and NPRDC-TR-81-3.

Instructors of 41 Navy electronics 'C' courses were presented with a list of 70 mathematics skills and asked to indicate (1) how important they were to successful course performance and (2) whether required skills were prerequisite to, reviewed in, or taught in the course. Based on results obtained, a mathematical skills test was developed for the 'C' course for the Aviation Electrician's Mate and Avionic Technician (AE/AV) ratings, and administered to entering and graduating students. Significant differences were found between the two groups on total test and in seven topic areas, most of which were taught during the course. Since student performance in both groups was only marginal in most topic areas considered critical for successful course performance, it is possible that either the importance of these skills is overrated or criteria for successful course completion are too low. (Author)

AD-A106 999/6 PC **A08**/MF **A01**
Logicon, Inc., San Diego, CA. Tactical and Training Systems Div.
Prototype Equipment Student Guide for ACE (Air Intercept Controller Prototype Training System).
Final rept. 28 Sep 78-28 Jun 81,
Nancy M. Smith, Ronald D. Granberry, Robin Halley, Diane Kerr, and Michael R. King. Sep 81, 170p
8641-A00A, NAVTRAEQUIPC-78-C-0182-10
Contract N61339-78-C-0182

This document provides an Air Intercept Controller (AIC) trainee with all of the information required to use the Air Controller Exerciser (ACE) training system. Descriptions of the component parts of this experimental prototype training system, and the operating procedures associated with them, are provided. The student objectives and syllabus of the training course offered with ACE are described. The vocabulary elements and system training procedures used with the system's advanced computer speech recognition and generation capabilities are also fully documented. (Author)

AD-A107 000/2 PC **A07**/MF **A01**
Logicon, Inc., San Diego, CA. Tactical and Training Systems Div.
Ordinal Syllabus for Air Intercept Controller Prototype Training System.
Final rept. 28 Sep 78-28 Jun 81,
Michael W. Grady, Robin Halley, and Larry H. Nowell. Sep 81, 150p 8641-A006, NAVTRAEQUIPC-78-C-0182-3
Contract N61339-78-C-0182
See also Rept. no. NAVTRAEQUIPC-78-C-0182 and NAVTRAEQUIPC-78-C-0182-1.

The Ordinal Syllabus for the Air Intercept Controller Prototype Training System presents training tasks to be addressed in the ordered sequence of the instructional flow for the automated adaptive training system. Whereas the preceding Behavioral Objectives and Objectives Hierarchy were job task oriented, in order to identify requisite skills for the Air Intercept Controller, the Ordinal Syllabus now addresses the sequence of instruction to be accomplished in the classroom and laboratory to develop the skills which will prepare the AIC trainee for control of live aircraft. Structuring the instructional flow places lessons within units of progressive levels of skills development. The sequencing integrates skills development with introduction to the training system and application of skills on the Training Enhancement Console. This report presents the prototype training system courseware. The instructional sequence for the courseware is identified in detail at the lesson level. Associated behavioral objectives, end of course standards, new vocabulary and new Naval Tactical Data System (NTDS) functions also are listed. Additionally, the syllabus development process is documented.

AD-A107 001/0 PC **A04**/MF **A01**
Logicon, Inc., San Diego, CA. Tactical and Training Systems Div.
Behavioral Objectives for Air Intercept Controller Prototype Training System.
Final rept. 28 Sep 78-28 Jun 81,
Robert Halley, J. Thel Hooks, Jr., Harry G. Lankford, and Larry H. Nowell. Sep 81, 68p 8641-A004, NAVTRAEQUIPC-78-C-0182-1
Contract N61339-78-C-0182

The Behavioral Objectives Report has multiple functions and purposes, both to the contractor and to the Government. For the contractor, this report provides the impetus to perform an extremely close review of the Air Intercept Controller (AIC) Job Task Analysis previously performed by Logicon. From this careful survey came the behavioral objectives which make up the core of this report. Often, as in this case, the step-by-step review of the job also (1) helps to define areas of the job previously undefined or loosely defined and (2) helps to uncover job tasks previously unaddressed. For the Government, the report serves at least two functions. First, the report allows the contracting agency a means for detecting the direction and scope of the work being done by the contractor. In this way, any existing misunderstandings can be cleared up at

an early date. Second, the report serves as a baseline document for establishing mutually defined concepts of the training development task ahead.

AD-A107 002/8 PC **A03**/MF **A01**
Dunlap and Associates, Inc., La Jolla, CA. Western Div.
Conceptual Development of a Preliminary LSO Carrier Landing Training Aid.
Final rept. Mar 78-Apr 80,
Clyde A. Brictson, and Steven T. Breidenbach. Sep 81, 44p NAVTRAEQUIPC-77-C-0166-2
Contract N61339-77-C-0166

A conceptual plan designed to aid the Landing Signal Officer (LSO) in training pilot carrier landing skills is described. The plan, named the Automated Performance Assessment and Remedial Training System (APARTS) employs basic principles of learning in integrating the Night Carrier Landing Trainer (NCLT) with Field Carrier Landing Practice (FCLP). Application of the APARTS conceptual plan resulted in the development of two computer programs, PADDLES and GRADER, which are described and documented. The two computer programs process, store and summarize LSO grades and comments of a pilot's landing performance during FCLP. Individualized training is accomplished through diagnostic training feedback provided by program printouts. NCLT remedial instruction is specified to correct a pilot's landing technique problems identified during FCLP. Future development and integration of APARTS for improved carrier landing training effectiveness is outlined. (Author)

AD-A107 003/6 PC **A03**/MF **A01**
Dunlap and Associates, Inc., La Jolla, CA. Western Div.
Training Improvements for the Tactical Aircrew Training System (TACTS): Project Summary Report.
Final rept. Aug 78-Aug 80,
A. P. Ciavarelli, A. M. Williams, and G. R. Stoffer. Sep 81, 47p NAVTRAEQUIPC-78-C-0136-3
Contract N61339-78-C-0136

This report presents summarized information related to the Tactical Aircrew Combat Training System (TACTS) training improvements program. The two major sections of the report area addressed to: (1) a description of a computer based TACTS debrief system, referred to as the Performance Assessment and Appraisal System (PAAS), and (2) a problem definition study of air intercept missile (AIM) envelope recognition training. The preliminary design of a computer based system has been completed and a single design module, Performance Assessment and Combat Effectiveness (PACE), is ready for operational test and evaluation. Summarized information from a more comprehensive study of U.S. Navy air-to-air missile envelope training problems is included. Recommendations for improving fleet envelope recognition training are reviewed. (Author)

AD-A107 030/9 PC **A04**/MF **A01**
New York State Coll. of Agriculture and Life Sciences, Ithaca. Dept. of Education.
Technical Communication--Taking the User into Account.
Research rept. 1 Jun-31 Aug 81,
Thomas L. Crandell, and Marvin D. Glock. Aug 81, 59p Rept nos. RR-5-SER-B, TR-4
Contract N00014-80-C-0372
Prepared in cooperation with Broome Community Coll.

This research study investigated whether reading effectiveness of procedural texts for a performance task is influenced by media formats which differed in design according to the Educational Cognitive Style (ECS) preference of the user/reader. Significant individual differences among the cognitive style types in their abiiity to follow the directions was found. One cognitive style type in particular tended to be more compatible with processing and understanding the technical information. Statistically significant differences were also found to result from the effect of media format design--graphics had a strong facilitative effect on user efficiency and accuracy. These results indicated that to plan and design effective instructional materials which maximize the user's understanding of the task, designers should recognize and focus on the user's strengths and weaknesses for processing technical information. A model for designing technical instructions based on the user's needs was presented. (Author)

AD-A107 100/0 PC **A02**/MF **A01**
Military Academy, West Point, NY. Office of the Director of Institutional Research.
Characteristics of the Class of 1985,
John W. Houston. Sep 81, 19p Rept no. 81-014

This report presents the biographical characteristics and achievements of the 1,524 new cadets and fourteen re-entered or turned back cadets who entered the United States Military Academy in the Class of 1985. (Author)

AD-A107 103/4 PC **A10**/MF **A01**
Air War Coll., Maxwell AFB, AL.
Air War College Class of 1981 Retention Survey.
Research rept.,
Robert E. Lee, Jr. Apr 81, 218p Rept no. MS108-81

This study reports the results of a retention survey administered by the author to the active-duty Air Force members of the Air War College Class of 1981. The purposes of the survey were to assess the career and retention attitudes of the Class of 1981, determine the factors shaping those attitudes, and compare the results obtained with those from a similar survey administered to the Air War College Class of 1980. The 1981 survey focused on various factors which affect retention, including financial matters, family considerations, leadership, and social life/camaraderie. It also sought to determine the career intentions of the Class of 1981. The results of the 1981 survey were in many respects better from an organizational viewpoint than were the results of the 1980 survey. The analysis of the results also revealed that the retention outlook among high-quality senior officers is positive and healthy. (Author)

AD-A107 115/8 PC **A07**/MF **A01**
Air Force Occupational Measurement Center, Randolph AFB, TX.
Avionic Communications and Avionic Navigation Systems Specialties AFS 328X0 and 328X1.
Occupational survey rept.
Sep 81, 145p

This report evaluates the feasibility of consolidating Avionic Communications (AFS 328X0) and Avionic Navigation Systems (AFS 328X1) specialties to decrease specialization and job dissatisfaction, and to increase personnel utilization. The job structure resulting from the combined sample of AFS 328X0 and AFS 328X1 was very heterogeneous. Sixty-nine job types making up 12 clusters and four independent job types were found. These grouped into four functional areas; primarily 328X0 technical jobs; technical jobs which overlapped the 328X0 and 328X1 specialties; primarily 328X1 technical jobs; and management and support jobs. The area of overlap was relatively small in proportion to the specialty specific functional areas. The findings of this study indicate that, while merger of these two specialties is possible, the majority of jobs are being served satisfactorily by the present classification structure. Both career ladder analysis and duty AFSC analysis show that the degree of differentiation is far greater than the degree of commonality. Review of the training programs indicate that such an AFSC consolidation would impact negatively on more jobs that it would help.

AD-A107 177/8 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Federal Personnel and Compensation Div.
Initial Skill Training for Navy Enlisted Personnel.
29 Jun 81, 4p Rept no. GAO/FPCD-81-56

Our survey addressed how the Navy determines which job tasks a sailor should know, how it insures the tasks are taught, and whether fleet supervisors are satisfied with recent graduates of initial skill training. (Author) We note that the Navy is taking action to improve skill training by developing new training curricula specifically linked to the job tasks relevant to the Navy ratings. Because these new curricula are not yet fully developed, however, we could not assess the effectiveness of the Navy's efforts to improve initial skill training. Although at this time we do not plan further analyses of the Navy's efforts to link job tasks to training curricula, we express here some concerns that we believe should receive attention as the Navy moves forward in improving initial skill training.

AD-A107 178/6 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Federal Personnel and Compensation Div.
Alternatives to the Current Method of Computing General Schedule Pay.
26 Aug 81, 4p Rept no. GAO/FPCD-81-60

General Schedule employees' annual salaries are based on 2,080 hours, or 260 workdays, even though there are usually one or two additional workdays in a calendar year for which employees are also paid. Our review showed that computing biweekly pay using either actual or average work hours in a year would reduce Government costs by approximately $120 million annually. We reviewed the legislative basis for establishing the existing method for computing pay, examined alternatives to the current method, and examined the impact these alternatives would have on payroll systems. We identified two feasible alternatives to compensate employees on the basis of either actual or average work hours in a calendar year.

AD-A107 179/4 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Federal Personnel and Compensation Div.
Follow-Up on Actions to Improve Coordination and Utilization of Human Resources Research and Development.
23 Jul 81, 7p Rept no. GAO/FPCD-81-62

To identify the actions taken to coordinate and encourage the use of human resources research and development, we interviewed key personnel within the Office of the Assistant Secretary of Defense (OASD) (Manpower, Reserve Affairs and Logistics (MRA&L) and the Office of the Under Secretary of Defense for Research and Engineering (Research and Advanced Technology) and at the major laboratories in each service which conduct human resources research. We also reviewed the laboratories' research plans and programs, their activities aimed at increasing utilization of human resources research and development, and tri-service efforts to improve research coordination and the use of results. In addition, we reviewed a wide variety of literature published since 1965 on knowledge transfer and research utilization. The scope of our review was limited in that we did not assess how much the actions taken have increased utilization, nor did we try to review the entire human resources research and development program or to judge its scientific merit and professionalism. Our review of laboratories focused on ARI, NPRDC, and AFHRL because they are the principal DoD human resources laboratories, accounting for 58 percent of military science and technology in this area during 1980.

AD-A107 180/2 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Federal Personnel and Compensation Div.
Obstacles Hamper the Office of Personnel Management's Evaluation of the Implementation of the 1978 Civil Service Reform Act.
14 Sep 81, 6p Rept no. GAO/FPCD-81-69

No abstract available.

AD-A107 181/0 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Federal Personnel and Compensation Div.
Problems with the Small Business Administration's Merit Appraisal and Compensation System.
21 Sep 81, 8p Rept no. GAO/FPCD-81-74

Some of these problems appear to be associated principally with implementation; others appear to be recurring such as: (1) difficulties in developing, with employee involvement, meaningful performance standards; (2) problems with rating distribution skewness, resulting in management's prescribing a distribution of ratings contrary to the Office of Personnel Management (OPM) regulation; and (3) problems with using preestablished performance objectives as the basis for performance appraisals leading to the substitution of new appraisal criteria after the appraisal period contrary to the requirements of the Civil Service Reform Act. There are significant potential problems with SBA's merit pay system in 1981. However, we believe that suspending merit pay until these problems are resolved would not be feasible because of the difficulties in changing the compensation approach back to the General Schedule system.

AD-A107 183/6 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. General Government Div.

Fewer Agent Transfers Should Benefit the FBI and Its Agents as Well as Save Money.
24 Sep 81, 10p Rept no. GAO/GGD-81-102

In response to concerns expressed by members of the Congress, agency officials, and individual agents, we recently conducted a survey of agent transfer policies and programs in the Secret Service; the Bureau of Alcohol, Tobacco and Firearms; and Federal Bureau of Investigation (FBI). Our objectives were to determine whether rotation programs (1) are similar among Federal law enforcement agencies, (2) negatively affect investigations, (3) result in unnecessary costs to the Government, and (4) adversely affect agents' financial situations and career goals. Because recent changes in your Career Development Program have alleviated the problems we identified during our survey, we have discontinued our work on FBI agent transfers. We believe that the Career Development Program modifications should benefit both the FBI and the individual agents. The full extent of these benefits, however, will not be known until the new policy has been in effect for a while.

AD-A107 189/3 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Accounting and Financial Management Div.
Review of Circumstances of the Mass Removal of Statutory Inspectors General.
9 Jul 81, 3p Rept no. GAO/AFMD-81-86

No abstract available.

AD-A107 190/1 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Accounting and Financial Management Div.
Allegations that a Political Appointee at the Environmental Protection Agency was Exercising Control over the Office of the Inspector General.
25 Jun 81, 4p Rept no. GAO/AFMD-81-77

This letter is in response to a request regarding a political appointee allegedly exercising control over the Environmental Protection Agency's (EPA's) Inspector General's Office. In this regard, a copy of was supplied an article from the February 6, 1981, Chicago Tribune indicating that a Mr. James F. Browne was the political appointee in question, and that he had ordered briefings on some of the most sensitive cases in the Inspector General's files. The Subcommittee wanted information on: the background and qualifications of Mr. Browne, including verification of statements in the Chicago Tribune that Mr. Browne's political background involved working as an advance man for the Reagan/Bush campaign; the background of Mr. Ernest Minor, who as Special Assistant to the Acting Administrator hired Mr. Browne; the impressions left with Office of Inspector General personnel as to Mr. Browne's role in their office; the type of documents Mr. Browne had access to and whether these documents are commonly disclosed during the Inspector General's work; and the date after which Mr. Browne was no longer working with personnel in the Inspector General's Office.

AD-A107 191/9 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Social Security Administration Policies for Managing Its Administrative Law Judges.
2 Jun 81, 10p Rept no. GAO/HRD-81-91

This deals with issues concerning whether the Social Security Administration's (SSA's) Administrative Law Judges (ALJs) are required to hear a certain number of cases a year or are limited in the number of reversals they can make. Also assessing the impact on an ALJ's ability to conduct fair and proper hearings if SSA has such policies regarding production and reversal rates.

AD-A107 193/5 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Issues Related to the Longshoremen's and Harbor Workers' Compensation Act.
Interim rept.
12 Jun 81, 11p Rept no. GAO/HRD-81-107

To determine the effects of the 1972 amendments to LHWCA, we interviewed (1) Labor officials in Washington, D.C., and in the district offices who have responsibility for administering this compensation program; (2) officials representing insurance carriers, maritime employers, and maritime employees; and (3) attorneys representing employees and employers in LHWCA compensation cases. We also reviewed recent testimony before the House Committee on Education and Labor and the Senate Committee on Labor and Human Resources on the administration of this act. To evaluate Labor's procedures for claims administration and adjudication, we reviewed 100 randomly selected cases in each the San Francisco and New York district offices. We also used a questionnaire to obtain program information from the other district offices responsible for handling LHWCA claims. We validated selected responses to our questionnaire by performing limited verification work at the Long Beach, Houston, New Orleans, and Boston district offices. Other information on program administration was obtained from OWCP reports on district office LHWCA activities.

AD-A107 197/6 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
The Veterans Administration's Efforts to Consolidate Computer Programming Resources at a Single Location.
18 Sep 81, 17p Rept no. GAO/HRD-81-148

The purpose of our review was to assess the adequacy of the tangible or measurable aspects of VA's justification for establishing the CDC in Austin. We examined the estimate of costs and benefits of establishing the CDC derived from comparing the costs of performing computer program development and maintenance work over a 5-year period under (1) the present decentralized or five-DPC approach, and (2) the proposed centralized or CDC approach. (Within the cost/benefit frame of reference, the costs of the present approach are called benefits if they exceed the costs of the proposed approach. Further, savings or net benefits are the costs of the present approach in excess of the proposed approach.) We also examined the methodology and productivity data ODM&T used to project personnel savings to accrue from establishing the CDC. We used CDC cost and benefit data available as of the end of April 1981.

AD-A107 265/1 PC **A10**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
The Determinants of Career Decisions of Air Force Pilots.
Doctoral thesis,
Russell Theodore Roth. May 81, 201p Rept no. AFIT-CI-81-9D

The present study analyses the individual career decisions of Air Force pilots. The inability of the Air Force to retain adequate numbers of qualified pilots in recent years motivated this study. This thesis presents a model of career choice based upon individual utility maximization. The individual is assumed to maximize his utility between continuing as an Air Force pilot and moving to the private sector. Private sector employment may be in either the airline industry or some other segment of the economy. A utility-maximizing choice is made in each discrete time period. The data used in the estimation of this model comes from officer personnel records for pilots who began service between 1968 and 1972. Their individual characteristics were combined with the appropriate economic factors in each year to model their choices. An error components specification with an equicorrelated correlation matrix was used to estimate a multivariate probit model. Likelihood ratio tests with an independent multivariate probit model conclusively rejected the independent probit model. The results of the estimations are consistent with the theoretical model presented. The rate of airline hires has a negative effect on retention. The real wage level of Air Force pilots and their pay in relation to civilian pilots has a positive effect on the rate of retention and the individual probability of remaining in the Air Force. The rate of unemployment also has a positive effect on the probability of remaining in the Air Force. (Author)

AD-A107 298/2 PC **A04**/MF **A01**
Air War Coll., Maxwell AFB, AL.
Performance as a Factor in Enlisted Promotions.
Research rept.,
Earl R. Reinke, Jr. Apr 81, 73p Rept no. MS114-81

This report reviews the events which led to the adoption of the Weighted Airman Promotion System (WAPS) and its stated objectives, and examines several promotion cycles and the manner in which the WAPS factors interact to make promotion selections. It also reports on field research conducted to determine if there is discrimination within the Airman Performance Report beyond WAPS' capability for data capture, and concludes that a revalidation of WAPS, similar to its original field test, is overdue. (Author)

AD-A107 316/2 PC **A03**/MF **A01**
System Development Corp., Santa Monica, CA.
Utilization of Tactical Computers for Training: Field Evaluation Plan.
Research note,
W. G. Hoyt, A. K. Butler, and P. W. Leung. 5 Dec 75, 40p SDC-TM-5544/002/00, ARI-RR-80-30
Contract DAHC19-75-C-0031

This report describes Phase V in the development of TACFIRE Automated Instruction (AI) courseware. The overall project is aimed at extending the scope of CAI to the development of self-instructive procedures and programs for users of tactical data processing systems. This report covers the evaluation plan as such: procedures and methodology for performing a review of the TACFIRE courseware content, procedures and requirements for demonstrating the execution of TACFIRE courseware on the ARI and TACFIRE operating systems and the procedures for assessing the acceptability of TACFIRE AI courseware by field artillery personnel. (Author)

AD-A107 342/8 PC **A05**/MF **A01**
Dunlap and Associates, Inc., La Jolla, CA. Western Div.
Development of a Computer Based Air Combat Maneuvering Range Debrief System. Volume I.
Interim rept. Aug 78-Jan 80,
Anthony P. Ciavarelli, Kenneth W. Pettigrew, and Clyde A. Brictson. Sep 81, 83p NAVTRAEQUIPC-78-C-0136-1
Contract N61339-78-C-0136

Volume I of this Interim Report presents an overview of the technical approach to ACMR debrief development, and a preliminary debrief design based on key training objectives and their associated aircrew task measures. The requirements for a computer based debrief system are discussed, together with the rationale for selection of an HP 45-T system. Preliminary data formats for key training objectives are presented. Finally, ACMR debrief software packages which are currently under development are identified and described. The proposed debrief system is responsive to an operational requirement for both overall performance assessment and diagnostic appraisal. For this reason, we have chosen to call our debrief system the Performance Assessment and Appraisal System (PAAS). Future plans are outlined, and center chiefly on the development of a demonstration system for ACMR debrief. Further development of criterion measures across remaining training objectives will be necessary to complete a final debrief design such that it represents a full treatment of all aspect ACM performance evaluation. (Author)

AD-A107 423/6 PC **A07**/MF **A01**
Science Applications, Inc., McLean, VA.
On the Design of Simulations of Command and Control Processes.
Final rept. 1 Aug 79-31 Oct 80,
Roland V. Tiede, Roger A. Burt, and Theodore T. Bean. 26 Nov 80, 141p SAI-81-285, ARI-RN-80-39
Contract MDA903-78-C-2030
See also Rept. no. ARI-RN-80-40, AD-A107 424 and ARI-TR-421.

This report covers two additional design requirements to an existing design for a battle simulation intended for research, development, or training. The first requirement is to simulate the command and control processes so that they reflect human performance in the information processing and decision making sequences. The second is to provide alternative configurations for the 'player' staff modules so that the investigator may select the configuration best suited to his behavioral research objectives. Both problems are approached by combining the known human factors in command and control with a detailed structuring of the action processes employed by the command group/staff. All relevant aspects of human performance except the higher-level decision making operations can be realistically simulated. A trade-off is found to exist in the alternative configurations between the realism of staff play, the ability to make behavioral measurements, and the cost of personnel and computer hardware/software. (Author)

AD-A107 424/4 PC **A07**/MF **A01**
Science Applications, Inc., McLean, VA.
Some Guidelines for Effective Task Design in Command and Control Simulations.
Final rept. 1 Aug 79-31 Oct 80,

Roland V. Tiede, Roger A. Burt, and Theodore T. Bean. 26 Nov 80, 149p SAI-81-285A, ARI-RN-80-40
Contract MDA903-78-C-2030
See also Rept. no. ARI-RN-80-39, AD-A107 423 and ARI-TR-421.

This report develops principles of task design for interactive simulations in which staff players execute the command and control of a simulated battle. A companion report on the design of simulations of command and control processes presents the basic design framework of a battle simulation capable of application alternatively to research, development, or training. This framework includes consideration of alternative configurations of the player staff modules so that an investigator may select a configuration best suited to his behavioral research objectives. The guidelines for effective task design are developed from the alternative configuration. (Author)

AD-A107 437/6 PC **A22**/MF **A01**
National Security Industrial Association, Washington, DC.
Proceedings of the 2nd Interservice/Industry Training Equipment Conference Held in Salt Lake City, Utah, November 18 through November 20, 1980.
1980, 513p

Partial contents: CIG Data Bases; Where are We Headed; Automatic Transformation Of the DMA DDB For Real Time Visual Simulation; Automation Of Data Base Development In Computer Image Generators; Effective Antialiasing Of Computer Generated Images; Distortion Correction In Computer-Image Generation-Based Wide Angle Visual Display Systems; Computer Generation Of Curvilinear Objects; Joining Techniques For Optically Combined Visual Display Systems; High Output-High Speed Video Images Projector, Adapted To The Simulation Needs; Behavioral Bases For Determining Vehicle Detailing In Simulation Displays; Training Techniques Using Computer Generated Imagery (CGI); Digital Visual Special Effects; Visual Cue Requirements For Terrain Flight Simulation; A New Visual System Architecture; A New Approach To CGI Systems; Realscan-A CIG System With Greatly Increased Image Detail; Conceptual Design of A Rotorcraft Advanced Visual System.

AD-A107 469/9 PC **A02**/MF **A01**
Academy of Health Sciences (Army), Fort Sam Houston, TX. Health Care Studies Div.
Field Unit Readiness Study (FURS).
Final rept. Jan-Sep 81,
A. David Mangelsdorff, Terry Michael Rauch, Patricia A. Twist, and A. J. Freiin. Sep 81, 25p Rept no. HCSD-81-014

The study assessed the perceived level of MOS proficiency training of 91B TOE personnel, the number of tasks in which 91Bs felt proficient, where the training was provided, and the job satisfaction of the 460 medical enlisted personnel surveyed at Fort Hood, Texas. There were significant differences in the distribution of respondents at the work centers (Darnall Army Hospital, Troop Medical Clinic, Bn Aid Station, Evac Hospital, Motor Pool, and Other). Work center location significantly affected the amount of training the 91Bs received, the level of proficiency perceived, and the satisfaction of the respondent. (Author)

AD-A107 470/7 PC **A03**/MF **A01**
Academy of Health Sciences (Army), Fort Sam Houston, TX. Health Care Studies Div.
Flexitime in an Army Medical Center.
Final rept.,
A. David Mangelsdorff. Apr 81, 35p Rept no. HCSD-81-002

The compressed and flexible workweeks have been receiving increased attention in the federal government. The use of variable work schedules, known as flexitime, allows employees some latitude in establishing their starting and stopping times on the job. The flexible working hours scheme is not applicable to the enhancement of the work environment in all departments of all organizations. The objectives of the present study were: to determine the effects of flexitime on staff perceptions and to determine whether there are differences between activities on flexitime versus activities not on flexitime. The overall results of the study suggest that flexitime is perceived as more demanding on supervisors and those with specific types of responsibilities (like direct patient care).

AD-A107 472/3 PC **A04**/MF **A01**
Air Force Occupational Measurement Center, Randolph AFB, TX.
Airborne Communication Systems Career Ladder, AFSC 294X0.
Occupational survey rept.
Jul 81, 74p

An occupational analysis was conducted of the Airborne Communications Systems specialty (AFSC 294X0) at the request of Keesler Technical Training Center. This was the initial survey of this career ladder and, for the sake of economy, was done jointly with the Ground Radio Operator (293X3) specialty. Airborne Communications personnel were surveyed worldwide and data were collected from 335 of the 437 individuals in the career field (77 percent).

AD-A107 473/1 PC **A05**/MF **A01**
Air Force Occupational Measurement Center, Randolph AFB, TX.
Fuels Career Ladder AFSC 631X0.
Occupational survey rept.
Oct 81, 81p

This report presents the results of a detailed Air Force occupational survey of the Fuels specialty (AFS 631X 0). This survey was requested by HQ ATC/TTQ to provide current task and background data for the review and update of the Specialty Training Standard (STS). Additionally the data have been analyzed to provide the job structure of the career field, levels of job satisfaction, and other pertinent information concerning the utilization of personnel in this specialty.

AD-A107 510/0 PC **A10**/MF **A01**
Naval Postgraduate School, Monterey, CA.
A Descriptive Analysis of First Term Attrition from U.S. Naval Ships.
Master's thesis,
Carl Glynn Carlson. Sep 81, 202p

This thesis was conducted to analyze certain factors effecting first-term attrition from U.S. Naval ships. The Survival Tracking File (STF) was used as the primary data source, and from it files were constructed that permitted three areas of study. First, the overall cohort of a year's worth of first term enlistees was examined. The survival curve for the cohort was generated and individual monthly cohorts were examined for attrition patterns. Secondly, overall attrition percentages were calculated for individual ships and for classes of ships and these attrition percentages were then examined for differences using statistical techniques. An ANOVA model using transformed data proved accurate in explaining attrition variance. Lastly, a comparison between attrition per month and underway hours per month was made for classes of ships and for individual ships of three specific classes. A rough relationship was observed, for certain classess of ships, between peaks of high underway hours and peaks of attrition. In looking at individual aircraft carriers, the attrition percentage seemed to be inversely proportional to underway hours per month. Several of these findings warrant further investigation so that the Navy may more fully understand it attrition problem and thereby take steps to alleviate it. (Author)

AD-A107 530/8 PC **A13**/MF **A01**
System Development Corp., Santa Monica, CA.
Application of Tactical Data Systems for Training. Volume IV. Development of Courseware and Analysis of Results for GED Math.
Final rept.,
W. G. Hoyt, A. K. Butler, and F. D. Bennik. 2 Jan 74, 278p SDC-TM-5261/003/00, ARI-RN-80-28
Contract DAHC19-73-C-0029
See also Volume 3, AD-A107 698.

This research report demonstrates that a complex Computer-Assisted Instruction (CAI) system can be integrated within a tactical computer system and that learning does take place within the tactical computer environment. While it is unreasonable to expect that a given method of instruction will be applicable to all Army personnel, it should at least cover a fairly broad range of personnel with varying aptitude (G) scores. These personnel present problems in regard to training costs. While student costs (time) is a consideration, instructor time (cost of preparation and instructing) is a more heavily weighted factor. A training program which has the capability to reduce instructor time in relation to student time offers a cost-effective, cost-saving approach to training.

AD-A107 531/6 PC **A03**/MF **A01**
System Development Corp., Santa Monica, CA.
Utilization of Tactical Computers for Training: Analysis of System and Training Requirements.
Research note,
W. G. Hoyt. 20 Jun 75, 42p SDC-TM-5544/000/00, ARI-RN-80-29
Contract DAHC19-75-C-0031

This report describes Phase V in the development of TACFIRE Automated Instruction (AI) courseware. The overall project is aimed at extending the scope of CAI to the development of self-instructive procedures and programs for users of tactical data processing systems. This report covers the evaluation plan as such: procedures and methodology for performing a review of the TACFIRE courseware content, procedures and requirements for demonstrating the execution of TACFIRE courseware on the ARI and TACFIRE operating systems and the procedures for assessing the acceptability of TACFIRE AI courseware by field artillery personnel.

PB82-121914 CP **T05**
Army Support Command, Fort Shafter, HI.
EEO System.
Software.
22 Mar 80, mag tape FSWEC-80/0114
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-121922.

The data system was created as an interim arrangement to provide periodic feedback reports to the managers and supervisors as required by a recent Department of Army survey to monitor and evaluate the affirmative action plan...Software Description: The system is written in the COBOL programming language for implementation on an IBM 360/50 computer using the OS/MFT operating system. The computer memory requirement is 100K.

PB82-121922 PC **A04**/MF **A01**
Army Support Command, Fort Shafter, HI.
EEO Statistics. Computer Operation Manual.
Aug 80, 55p FSWEC-80/0114-1
For system on magnetic tape, see PB82-121914.

The EEO System was created as an interim arrangement to provide periodic feedback reports to the managers and supervisors as required by a recent Department of the Army survey to monitor and evaluate the affirmative action plan.

PB82-128257 PC **A07**/MF **A01**
Office of Personnel Management, Washington, DC. Office of Labor-Management Relations.
Digest of Labor Arbitration Awards in the Federal Service (Supplement No. 10).
Jul 81, 142p OPM/OLMR-82/1
See also Supplement Number 9, PB81-214959.

The report is the 10th periodic supplement to the March 1978 Digest of Labor Arbitration Awards in the Federal Service. It provides subject head notes, statements of issue, and summaries of the award and its basis, for arbitration cases as of July 1981. It also indicates the parties, the arbitrator and the date of the award.

PB82-132762 PC **A04**/MF **A01**
Lesotho Agricultural Sector Analysis Project, Maseru.
Profiles of Basotho Farmers. Part I: Images of Basotho Farmers. Part II: Are the Basotho Subsistence Farmers. Part III: Progressive Farmers in Lesotho.
Discussion paper,
Gene C. Wilken, and Martin H. Fowler. Jun 79, 59p LASA/DP-8, AID-PN-AAH-351
Prepared in cooperation with Colorado State Univ., Fort Collins. Dept. of Economics.

Understanding the complex characteristics of Basotho farmers - who are resilient but who also resist introduction of new crops, tools, or techniques - is necessary if development planning for Lesotho's agricultural sector is to be effective. This report characterizes Basotho farmers through three essays entitled Images of Basotho Farmers, Are the Basotho Subsistence Farmers, and Progressive Farmers in Lesotho. All three studies elucidate the relationship between previous assump-

tions and present policy. It is uncertain that these programs can effectively disseminate new methods or produce widespread benefits in the agricultural sector. Indeed, they may create social disparity and thus impede agricultural development. Reliance on the inherent hardiness of the Basotho farmer and his highly developed local institutions represents a sounder basis for future sector development.

PB82-133737 PC **A14**/MF **A01**
American Institutes for Research, Palo Alto, CA.
Synthesis of Recent Research on Medical Career Decisions: A Comparative Study of Physicians from Two Decades. Executive Summary and Final Report.
Rept. for 1 May 80-28 Feb 81,
Sandra Reitz Wilson, Frances B. Stancavage, and Lauress L. Wise. Mar 81, 316p NCHSR-81-232
Grant PHS-HS-04153

The research project compared the career development patterns of two recent cohorts of physicians, participants in AIR's Project TALENT Longitudinal Study of the High School classes of 1960-63 and participants in the AAMC's Longitudinal Study of Medical School Graduates of 1960. These cohorts obtained their medical degrees approximately a decade apart. For each cohort, profiles of the personal characteristics and educational experiences of physicians in nine specialty groups and six sizes of practice community were drawn. Multivariate discriminant analyses were also conducted to determine the predictability and practice location choice. Results indicated that these career choices are predictable at a level considerably above chance for both cohorts. Some changes attributable to historical trends in medical selection and training were observed, but in general, the nature of the predictive relationships and the level of predictability were stable across cohorts. Results of the analyses were incorporated into a model of medical career decision-making.

PB82-133760 PC **A04**/MF **A01**
Boston Univ., MA.
The Impact of Regulation upon Job Design: A Preliminary Study.
Final rept. Nov 80-Oct 81,
Paul Osterman. Oct 81, 60p ASPER/PUR-81/0419/A
Contract DL-B-9-M-1-0419

The purpose of this study was to conduct a preliminary inquiry into the question of whether government regulatory activity has led firms to alter the design of jobs. First, a series of interviews and case studies were conducted with several firms to develop an understanding of how the job design process works. The interviews led to a theory of job design which emphasizes that firms should not be viewed as internally homogeneous units. Rather different clusters of jobs have different security, advancement, and wage characteristics. Firms have some choice into which clusters tasks are placed and the determinants of these choices were examined. In the second part of the report a specific regulatory program, the Office of Contract Compliance, is examined. It was hypothesized that if this program is successful in improving opportunities for women by encouraging firms to create new jobs ladders then turnover rates (and quit rates) will decline. In a statistical study using national data it was found that in fact quitting varies inversely with the attention paid to an industry by the OFCCP. Thus this regulatory program does seem to influence job design and opportunity.

PB82-134131 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Federal Personnel and Compensation Div.
Civil Service Reform After Two Years: Some Initial Problems Resolved but Serious Concerns Remain.
10 Nov 81, 98p FPCD-82-1

The Office of Personnel Management and Federal agencies are currently implementing several major provisions authorized by the 1978 Civil Service Reform Act. GAO has identified several problems in the Senior Executive Service, Federal Equal Opportunity Recruitment Program, performance appraisal, and merit pay that could seriously affect the success of the Government's new personnel management system. Startup and transition problems that hindered the first-year operations of the Merit Systems Protection Board, the Office of the Special Counsel, and the Federal Labor Relations Authority have largely been resolved. However, Federal hiring restrictions have prevented these agencies from filling all authorized positions.

PB82-134206 PC **A06**/MF **A01**
Maurizi Associates, Sacramento, CA.
Using CWBH Data to Evaluate the Methods Used in the Urban Institute's Simulation Model of Unemployment Insurance Benefits.
Final rept. Nov 80-Apr 81,
Alex R. Maurizi. Apr 81, 110p ASPER/CON-80/0142/A
Contract DL-J-9-M-0-0142

This study compares data from five states in the Continuous Wage and Benefit History (CWBH) project with data from the same states in the Urban Institute's simulation model of unemployment insurance programs to determine whether there are any significant differences in the data regarding compensated weeks of unemployment, base period earnings and high quarter earnings. The model base period earnings data was found to be inaccurate and was improved using CWBH data.

PB82-134263 PC **A09**/MF **A01**
Public Health Service, Washington, DC.
National Conference for Institutions Preparing Health Educators, February 5-7, 1981, Birmingham, Alabama: Proceedings.
Feb 81, 192p DHHS/PUB-81-50171

The Birmingham conference centered on credentialing and curriculum issues with special reference to the national Role Delineation Project for health education. The Proceedings summarizes the issues covered in discussion groups and the conference's final recommendations. The texts of nine presentations are given in full. Appendices include an outline of the Role Delineation Project and the credentialing process, current accrediting bodies, and a bibliography.

PB82-136458 PC **A04**/MF **A01**
Veterans Administration, Washington, DC. Dept. of Medicine and Surgery.
Work Simplification Training Techniques and Materials.
25 Apr 66, 65p VA/TB-10-15
Supersedes Oct 59, TG10-9.

The training program in work simplification was prepared to help plan training sessions. The program can be used as a course in itself or as a supplement. The program is divided into: Suggested Course Outline, Training Aids, and Bibliography. The 36 color slides developed by the Veterans Administration (VA) are keyed to the suggested course outline. The sessions include attitude (philosophy), the planned approach to installing improvements, tools and techniques: motion economy, flow process charting, work count, layout and work distribution charting. Tools and techniques are further described, and effective use of several visual and audio aids is outlined. An annotated list of motion picture films on work simplification in hospitals and a bibliography are provided.

PB82-136912 PC **A03**/MF **A01**
Veterans Administration, Washington, DC. Reports and Statistics Service.
Employment and Unemployment Among Vietnam Era Veterans: An Analysis of the 1979 National Survey of Veterans,
James J. Byrne. Aug 81, 32p RESEARCH MONO-14-A, VA/81-5045

This report analyzes the data of the 1979 National Survey of Veterans and compares unemployment statistics for Vietnam-theater veterans with other veterans of the Vietnam era (VNE). Aggregate data show similar statistics for both Vietnam veterans and other veterans of comparable age, and the two groups are similarly distributed in demographic background characteristics and in labor market behavior. The differences which did appear, such as a higher percentage of unemployed college-educated Vietnam veterans, a lower percentage earning high salaries, and an urban-rural unemployment differential were not dramatic. The report recommends more detailed study of specific subgroups of Vietnam theater veterans, such as those with prolonged heavy combat experience and minority groups. A bibliography and a questionnaire are included.

PB82-137746 PC **A10**/MF **A01**
Northwestern Univ., Evanston, IL.
Organizational Socialization: Predictors of Commitment during and After Entry.
Doctoral thesis,
Roy W. Hinton. Aug 81, 209p DLETA-91-17-79-03-1
Grant DL-91-17-79-03
Prepared in cooperation with Department of the Navy, Washington, DC.

The predictors of commitment to membership in the Naval Reserve examined by this study include the individual's perceptions of various aspects of the organization, the process by which he/she made the decision to join, and support of family, friends and full-time employer. The research design, drawn from the organizational socialization literature, is a longitudinal study utilizing questionnaire data collected at entry into the organization and six months after entry. Seventy-five Naval Reservists are the focus of the research. Results indicate that support of family, friends and full-time employer, importance of extrinsic rewards, and perceptions of freely choosing to join are most strongly related to commitment. The sample was divided into two groups according to the extent to which the individual responds to demands of the situation or the extent to which he/she determines behaviors on the basis of internal dispositions. Results for the two groups suggest that degree of responsiveness to the situation or internal cues is an important moderating variable in determining predictors of commitment. Implications for researchers and practitioners are discussed.

PB82-138678 PC **A05**/MF **A01**
Holt (James S.), Washington, DC.
An Assessment of Factors Affecting Employment of Temporary Foreign Labor in the East Coast Apple Harvest,
James S. Holt. Mar 81, 90p DLETA-20-51-79-39-1
Contract DL-20-51-79-39

The purpose of this study was to identify why some apple growers, in areas using temporary foreign (H-2) workers were able to harvest their apples without such workers. Persons knowledgeable about the industry and growers were interviewed in each major apple producing area. The study found that most temporary foreign workers are employed in areas of low population density, and high seasonal labor demand, where apples are the predominent crop using seasonal labor, and in which the use of illegal aliens is still relatively limited.

PB82-139569 PC **A04**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
An Approach to Selecting Panels of Experts,
Howard Bregman, Ruth Katz, and John Salasin. Mar 77, 65p MTR-7482
Grant PHS-MH-26058

Selecting the right experts to participate in studies utilizing expert opinion is a complex task. The literature on selection of experts is sparse, but several problems have been identified: (1) stacked panels of experts, (2) experts who are experts in name only, and (3) interpretation of survey results when the experts surveyed are anonymous and participant selection criteria are secret or unknown. These problems were addressed in a survey of experts in the children's mental health services area. A method for selecting experts is presented and the results of its use are evaluated. The method is shown to be successful.

PB82-139577 PC **A03**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
The Delphi Technique: Analysis of Responses to a Survey of Children's Mental Health Services Development,
Howard Bregman, and John Salasin. Sep 77, 42p MTR-7631
Grant PHS-MH-26058

Analysis procedures were developed to analyze how well a modified Delphi survey process worked in developing consensus among a diverse group of experts. Procedures included: (1) measuring consensus among the experts' responses, (2) establishing statistical significance of responses, (3) determining which professional characteristics affected participants' responses, (4) determining how many experts and how many Delphi iterations would be needed for future surveys to identify R&D objectives, and (5) checking the reliability of the results. These procedures were applied to a modification of the Delphi technique which was used to survey experts in the area of children's mental health services to identify objectives for research and development in the children's area. The survey demonstrated that opinions and judgments generally con-

sidered to be too soft to be rigorous can be made amenable to measurement using the Delphi approach. Further, the measurements taken can be statistically analyzed yielding insight and understanding of the experts' position.

PB82-139585 PC **A04**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
An Approach to Identifying Objectives for Targeted Research Programs,
J. Salasin, and D. J. Entingh. Mar 77, 61p MTR-7490
Grant PHS-MH-26058

The paper describes a five-step generalized approach to defining technical R&D objectives for applied research programs. The approach emphasizes: (1) specifying the technical scope of the program, (2) describing desired end-results of the program ('targets'), (3) specifying the roles that objectives will play in the program and information needed to allow the objectives to serve those roles, (4) specifying a structure for representing objectives, and (5) planning processes for collecting needed information. Well-defined technical objectives can contribute to improved research planning, project and program monitoring, and dissemination and utilization of research results.

PB82-144478 PC **A07**/MF **A01**
ACKCO, Inc., Boulder, CO.
American Indian Jobs/Skills Bank.
Final rept.
Mar 81, 138p HUD-0002053
Contract DOL-9-99-2215-0822
Sponsored in part by Administration for Native Americans, Washington, DC. Bureau for Indian Affairs, Washington, DC.

This document represents the final report for the American Indian Jobs / Skills Bank project, which designed and field tested a national, computerized job referral system for American Indians. The project ran for over 15 months, beginning on June 7, 1979, and expiring on September 30, 1980. Project tasks included development of a national communications network; preparation, publication, and dissemination of a preliminary questionnaire, an information fact sheet, and a comprehensive questionnaire; development of a data processing system; development of relationships with 20 Federal agencies for their use of the jobs / skills bank referral service; and followup of applicant referrals. Other project tasks involved solicitation of participation of Indian Federal employees, field test and implementation, and preparation of materials related to tribal employment rights programs. The jobs / skills bank staff provided consultation to the Federal Interagency Task Force on Indian Women and to other groups. The bank referred 60 of its 989 applicants, and 4 of the 60 persons referred were hired as a result of the referrals; thus a 6 percent placement rate was achieved. Recommendations concerning future support of a jobs / skills bank project are that future contracts provide for an adequate distribution of staff to allow for the identification of an ongoing communication with Federal and other employees and that project staff include a full - time director and assistants in both program and technical areas. Moreover, some provision should be made which would allow for the referral of persons, who are obviously well qualified for positions in the Federal Government, to vacancies even though no comprehensive questionnaires are available in their field of expertise. Tables are supplied. Questionnaires, job announcements, sample forms, flow charts, and supplementary material are appended.

PB82-144494 PC **A25**/MF **A01**
Urban Inst., Washington, DC.
Future of State and Local Pensions.
Final rept.,
Harold A. Hovey. Apr 81, 576p HUD-0002058
Grant HUD-H-2921RG
Prepared in cooperation with Winklevoss and Associates, Philadelphia, PA, and Government Finance Research Center, Washington, DC. Sponsored in part by Department of Health and Human Services, Washington, DC; Department of Labor, Washington, DC; National Inst. of Education, Washington, DC, and President's Commission on Pension Policy, Washington, DC.

This study examines major economic issues surrounding State and local pensions including the size of plan benefits, the costs associated with pension plans and funding alternatives, investments of plan assets, reporting and disclosure practices, and the financial burdens that the funding of pensions creates for State and local governments. The study was based on a sample of 100 State and local pension plans drawn from the universe of plans with 1,000 or more members. The sample covers just less than three - fourths of all State and local workers enrolled in pension plans. The study examines benefit levels and pension plan design including adequacy of benefits, impact of inflation, and social security. It found that on a weighted average basis, the 100 large State and local plans replaced 109 percent of final disposable working income for employees retiring after 30 years of service at age 65 with a salary of $10,000. The study also examines pensions costs and funding including advance funding, pension cost estimates, sensitivity to economic assumptions, measurement of current service costs, and methods dealing with unfunded liabilities. Funding policy for cost - of - living increases, employer and employee sharing of cost and risk, investment results, and alternative investments are discussed. In addition, the study analyzes reporting and disclosure practices and trends and issues in plan design such as the effect of shifting age distributions on payroll increases and the increasing costs of pension contributions in the cities of New York City, N.Y., Chicago, Ill., Los Angeles, Calif., Philadelphia, Pa., Detroit, Mich., Baltimore, Md., and Houston and Dallas, Tex. A glossary is included.

PB82-145004 PC **A03**/MF **A01**
Brill (William) Associates, Inc., Annapolis, MD.
Crisis Intervention Training for Public Housing Residents and Staff: A Report on a Demonstration Program.
Final rept.
Jul 81, 46p HUD-0002131
Contract HUD-H-5186CA

This report describes a demonstration program in crisis intervention training for public housing residents and staff. The program was designed to increase the ability of residents and management staff to deal with the crises that face people who work and live in public housing. The program modified and adapted accepted forms of crisis intervention to public housing circumstances, and demonstrated this concept in Baltimore, Md. Such factors as the setting, the background and qualifications of participants, and the scope and purpose of the curriculum are described. The concluding section of the report presents lessons and guidelines that emerged from this experience. In contrast to the usual crisis intervention approach, the program was based on awareness that crisis is endemic to public housing residents, not an isolated event. Thus, the program's goal was to prepare crisis intervention facilitators who lived and would remain in the community, rather than outside support persons who would render assistance and leave. The training thus emphasized a process rather than directed solutions and was anchored in the crises trainees saw in their lives. Trainee reaction to the program was positive. Trainees gained an understanding of their reactions to stress and alternative ways of handling stress situations. Costs of the program, if implemented elsewhere, are deemed minimal if the guidelines developed here are followed. It is suggested that time and effort be expended toward recruiting trainers and organizing the program so that residents are informed of it. Charts, tables, and training instruments are provided.

PB82-802620 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Nurses: Emerging Roles. July, 1978-November, 1981 (Citations from the NTIS Data Base).
Rept. for Jul 78-Nov 81.
Dec 81, 197p
Supersedes PB80-813967, and NTIS/PS-79/0708. See also 1964-Jun 78, NTIS/PS-79/0707.

The bibliography cites studies on the assessment and effectiveness of nurses as nurse clinicians, practitioners and administrators. The acceptance of these roles by physicians and consumers are delineated. Requirements for education, licensure and credentialing are discussed. (This updated bibliography contains 190 citations, 18 of which are new entries to the previous edition.)

5J. Psychology (Individual and Group Behavior)

AD-A107 134/9 PC **A05**/MF **A01**
Missouri Univ.-Columbia. Tailored Testing Research Lab.
The Formation of Homogeneous Item Sets When Guessing is a Factor in Item Responses.
Research rept.,
Mark D. Reckase. Aug 81, 94p Rept no. RR-81-5
Contract N00014-77-C-0097

One of the major assumptions of latent trait theory is that the items in a test measure a single dimension. This report describes an investigation of procedures for forming a set of items that meet this assumption. Factor analysis, nonmetric multidimensional scaling, cluster analysis and latent trait analysis were applied to simulated and real test data to determine which technique could best form an unidimensional set of items. Theoretical and empirical evaluations were also made of the effects of guessing on the dimensionality of test data. The results indicated that guessing affected highly discriminating items more so than poorly discriminating items. However, the effect of guessing on the dimensionality of tests with common distributions of difficulty and discrimination indices was found to be minimal. Of the procedures evaluated for sorting items into unidimensional item sets, principal factor analysis of phi coefficients gave the best results overall. Nonmetric multidimensional scaling also showed promise when used with Yule's Y, phi, or tetrachoric similarity coefficients, but it did not perform as well as the factor analytic techniques on the real test data. In summary, guessing does have an effect on test data, but the effect is not very large unless items of extreme difficulty are present in the test. Of the procedures evaluated, traditional factor analytic techniques gave the most useful information for sorting test items into homogeneous sets. (Author)

AD-A107 135/6 PC **A02**/MF **A01**
Missouri Univ.-Columbia. Tailored Testing Research Lab.
Procedures for Criterion Referenced Tailored Testing.
Final rept. 1977-1981,
Mark D. Reckase. Aug 81, 25p
Contract N00014-77-C-0097

This report summarizes the research findings of a four-year contract investigating the applicablity of item response theory and tailored testing to criterion-referenced measurement. Six major areas were studied on the project. These included: (a) techniques for forming unidimensional item sets, (b) techniques for calibrating items, (c) item parameter linking procedures, (d) comparisons of latent trait models, (e) tailored testing procedures, and (f) decision making procedures. The results showed that factor analytic procedures were best at forming unidimensional item pools, the LOGIST calibration program performed slightly better than the ANCILLES program for item calibration, the maximum likelihood procedure using the LOGIST program generally gave the best linking, the three-parameter logistic model was preferred to the one-parameter model for tailored testing applications, the maximum likelihood based tailored testing procedure was slightly preferred to the Owen's Bayesian based procedure, and the use of the sequential probability ratio test with tailored testing resulted in substantial savings in test length. Overall, tailored testing was shown to be feasible for achievement testing applications. More detailed results are described in the papers and reports listed in this report. (Author)

AD-A107 295/8 PC **A03**/MF **A01**
Army Research Inst. for the Behavioral and Social Sciences, Alexandria, VA.
Target Information Processing: The Effects on Reaction Time of Terrain, Downlook Angle, and Response Processing Level.
Technical rept.,
Richard M. Johnson. Oct 80, 29p Rept no. ARI-TR-480

This experiment explored the applicability of a serial exhaustive memory scan as a model of the observer's cognitive behavior in a target acquisition task. Reaction times were examined for identification, recognition (friend-enemy), and set responses to stimulus scenes consisting of armored vehicles varying in background (forest, road, or plain) and downlook angle (10 de-

grees, 20 degrees, or 30 degrees). Positive set size was either one, two, or four vehicles. The results provided support for the serial exhaustive model in the linear set size function with a zero intercept of 1.4 seconds (s) and a slope of .2 s. Parallel functions were obtained for the forest condition adding .2 s over the equivalent road and plain conditions. The 10 degrees downlook angle resulted in the slowest response times, and the 20 degrees angle the fastest. The response times were the fastest for the positive set items only, followed in order by recognition and identification responses. (Author)

AD-A107 345/1 PC **A03**/MF **A01**
RAND Corp., Santa Monica, CA.
Spatial Learning and Reasoning Skill.
Interim rept. Jul 79-Jul 81,
Sarah E. Goldin, and Perry W. Thorndyke. Jul 81, 28p Rept no. RAND/R-2805-ARMY
Contract MDA903-79-C-0549
See also Rept. no. RAND/N-1595-ONR dated Dec 80, AD-A094 829.

A series of studies undertaken to identify skills required for successful spatial performance. A Study of requirements for distance estimation, self-orientation, and object location tasks supported our assumption that the type of spatial knowledge acquired depends on the learner's information source. A second study showed that filmed traversal of an unfamiliar route provides as much knowledge about landmarks, landmark sequence, and distances as a live tour, but not sufficient information about angles of turns to allow accurate self-orientation. Studies of cognitive mapping skill showed that good mappers excel at acquiring knowledge from navigation or maps, at manipulating information in memory, and in visual memory, visualization, and spatial orientation ability. Good and poor mappers do not differ in map reading, map interpretation, or navigation skill. Examination of two different strategies for learning a new environment from navigation indicated potential benefits from training strategies compatible with the learner's abilities. (Author)

AD-A107 347/7 PC **A03**/MF **A01**
United States International Univ., San Diego, CA. Family Research Center.
As Parents Go, So Go the Children. The Development and Adjustment of Children in the Military.
Interim rept.,
Edna J. Hunter, and Robert A. Hickman. 15 Jun 81, 36p Rept no. USIU-TR-81-01
Contract N00014-79-C-0519
See also AD-A093 811.

A review of military family research accomplished prior to 1980 indicates that almost one-half the total literature on military child adjustment and development deals with topics on father absence, family reunion/reintegration, adjustment to loss, adjustment to divergent cultures, mixed marriages, child abuse, relocation, childcare, and the impact of the prisoner of war experience on parental relations with children. The military lifestyle presents both opportunities for growth as well as family crises which engender problems for a developing child. Perhaps the two major findings emanating from most of these studies are that: (1) the mother fills a more critical family role within the military family than she does in civilian life, and (2) the children's adjustment is a direct reflection of how successfully the mother copes with the unique stresses posed by the military lifestyle. (Author)

AD-A107 362/6 PC **A03**/MF **A01**
Colorado Univ. at Boulder.
Cerebral Economics: Resource Competition within but not Between Hemispheres.
Technical rept.,
Alinda Friedman, Martha Campbell Polson, and Cameron G. Dafoe. Jun 81, 49p Rept no. TR-3
Contract N00014-79-C-0679
Prepared in cooperation with Alberta Univ.

In this paper, we test a model in which it is assumed that the left and right cerebral hemispheres have access to independent supplies of resources, which they may each use in most kinds of information processing situations. Eight male subjects were specifically selected for having demonstrated a strong right-hand superiority on several manual tasks, and a strong RVF-LH superiority for processing the stimuli we would be using as a verbal memory load in a dual-task situation. Their performance was then measured on the memory load task, on a target task in which pairs of stimuli were presented to either visual field and subjects performed physical or name identity judgments, and in a situation in which both tasks were combined. In our approach, right and left visual field trials of the target task combined with the verbal memory load are treated as two different dual-task situations, comprising cases of complete vs. no overlap in demand for left hemisphere resources, respectively. Subjects were paid for both single and dual-task performance; in the latter case, the payoff ratios rewarded them more for either their memory or target task accuracy. Decrements from single-task performance were less severe on both tasks when subjects were performing physical rather than name matches, and importantly, when the target stimuli were presented to the LVF rather than the RVF. The data support the idea that the resource supplies of the left and right hemispheres are independent, and have implications for both cerebral specialization and divided attention issues.

AD-A107 367/5 PC **A03**/MF **A01**
Missouri Univ.-Columbia. Tailored Testing Research Lab.
The Use of the Sequential Probability Ratio Test in Making Grade Classifications in Conjunction with Tailored Testing.
Research rept.,
Mark D. Reckase. Aug 81, 26p Rept no. RR-81-4
Contract N00014-77-C-0097

This report describes a study comparing the classification results obtained from a one-parameter and three-parameter logistic based tailored testing procedure used in conjunction with Wald's sequential probability ratio test (SPRT). Eighty-eight college students were classified into four grade categories using achievement test results obtained from tailored testing procedures based on maximum information item selection and maximum likelihood ability estimation. Tests were terminated using the SPRT procedure. The results of the study showed that the three-parameter logistic based procedure had higher decision consistency than the one-parameter based procedure when classifications were repeated after one week. Both procedures required fewer items for classification into grade categories than a traditional test over the same material. The three-parameter procedure required the fewest items of all, using an average of 12 to 13 items to assign a grade. (Author)

AD-A107 385/7 PC **A02**/MF **A01**
Colorado Univ. at Boulder. Center for Research on Judgment and Policy.
Integration of Theory and Research in Judgment and Decision Making.
Final rept. 1977-1981,
Kenneth R. Hammond, and Gary H. McClelland. Oct 81, 15p Rept no. CRJP-236
Contract N00014-77-C-0336

This is the final report on the project aimed at the integration of theory and research on judgment and decision making. The specific goals, methods, and results are briefly indicated. The principal results of the project include the publication of two books and six technical reports. (Author)

AD-A107 502/7 PC **A03**/MF **A01**
Colorado Univ. at Boulder. Inst. of Cognitive Science.
Analysis of the Decision and Verification Stock-market Tasks Using Additive Stage Process Methods.
Technical rept. 1 Jan-30 Jun 81,
Murray Singer. Jun 81, 36p Rept no. ICS-TR-107-ONR
Contract N00014-78-C-0433

Two additive stage processing models are presented that address some of the tasks reported in Antos, Kozminsky, Bourne, and Kintsch (1981). The development and application of these models to information analysis and decision procedures demonstrates their usefulness in structuring thinking and experimental design about critical, complex, real-life sorts of decisions. Both alternative processing models presented were constructed by carefully thinking out what mental operations are necessary to perform information analysis, decision and verification. Predictions are generated from the models and those predictions were compared to the data reported in Antos, et al. While some predictions of the model are supported, new experiments are needed to test more critical predictions. The intention of this work is to lay some of the theoretical groundwork for designing experiments that would provide information on the critical elements in how people understand facts in order to make decisions. (Author)

N82-11636/9 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Effects of Aircraft Noise on the Equilibrium of Airport Residents: Testing and Utilization of a New Methodology.
J. Francois. Sep 81, 34p NASA-TM-76628
Contract NASW-3542
Transl. Into English of "Repercussion du Bruit des Avions sur l'Equilibre des Riverains des Aeroports: Test et Mise au Point d'Une Methodologie Nouvelle" Paris, Aug. 1977 p 1-134. Transl. Was Announced as N81-27692. Transl. Scientific Translation Service, Santa Barbara, Calif. Original DOC. Prep. By Ifop/Etmar.

The focus of the investigation is centered around two main themes: an analysis of the effects of aircraft noise on the psychological and physiological equilibrium of airport residents; and an analysis of the sources of variability of sensitivity to noise. The methodology used is presented. Nine statistical tables are included, along with a set of conclusions.

PB82-131210 PC **A03**/MF **A01**
Florida Univ., Gainesville.
Informant Accuracy in Social Network Data V: An Experimental Attempt to Predict Actual Communication from Recall Data.
Final rept. 1979-80,
H. Russell Bernard, Peter D. Killworth, and Lee Sailer. 1 Sep 80, 30p BK-NSFIST-80-1
Contract N00C014-75-C-0441, Grant NSF-IST78-12801

The paper seeks to discover whether the known inaccuracy of informant recall about their communication behavior can be accounted for by experimentally varying the time period over which recall takes place. The experiment took advantage of a new communications medium (computer conferencing) which enabled the authors to monitor automatically all the interactions involving a subset of the computer network. The experiment itself was administered entirely by the computer, which interviewed informants and recorded their responses.

PB82-133513 PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC.
Effects of Time-Varying Noise on Annoyance: A Review,
Simone L. Yaniv, Jay W. Bauer, Daniel R. Flynn, and William F. Danner. Oct 81, 64p NBSIR-81-2377
Sponsored in part by Federal Highway Administration, Washington, DC.

The report summarizes the literature dealing with the adverse response of people to time-varying noise, and identifies both the acoustical and non-acoustical factors that influence the relationship between time-varying noise and annoyance. An examination of the laboratory research concerned with the functional relationship between annoyance and the temporal and acoustic parameters of noise shows the tenuousness of such relationships. The adequacy of currently used and/or proposed rating procedures for predicting subjective response to time-varying noise is examined. Critical gaps in current knowledge are identified.

PB82-133778 PC **A02**/MF **A01**
North Carolina Univ. at Charlotte.
Perception of Rape: Influence on Causal Attributions,
James W. Selby. Jan 81, 11p NIMH-81-47
Grant PHS-R01-MH-30702

Causal attributions made to the participants in a rape episode were examined through systematic variations of information in five major categories: characteristics of the rape victim; characteristics of the rapist; the nature of their interaction; environmental context of the rape; and characteristics of the observer. A more comprehensive understanding of how victims are viewed increases the effectiveness of community education programs, crisis counseling with victims and legal reforms.

PB82-802703 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Mental Health Services: Delivery Plans, Programs, and Studies. 1966-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1966-Nov 81.

Dec 81, 172p
Supersedes PB80-814114, and NTIS/PS-79/0805.

Selected abstracts are presented on plans, projects, programs, and studies related to the institutional delivery of mental health services at the state and community level. Studies on the review and evaluation of existing delivery systems are included. Services encompass those for alcohol and drug abuse, mental problems of the elderly, mental retardation, and other mental disorders of the population. (This updated bibliography contains 164 citations, 14 of which are new entries to the previous edition.)

PB82-802711 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Mental Health Services: Needs and Demands. 1973-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1973-Nov 81.
Dec 81, 63p
Supersedes PB80-814247, and NTIS/PS-79/0806.

Selected abstracts are presented on assessing needs and demands for mental health services. The services include those for alcohol and drug abuse, mental disorders of the population. (This updated bibliography contains 56 citations, 7 of which are new entries to the previous edition.)

5K. Sociology

AD-A106 836/0 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Review of the Navajo and Hopi Indian Relocation Commission's Program.
2 Jul 81, 10p Rept no. GAO/CED-81-139

The purpose of this review was to examine the costs of the Commission's relocation program, including the specific areas of (1) replacement home benefit costs, (2) off-reservation relocations, (3) temporarily-away benefits, and (4) appraisal and propertly acquisition.

AD-A106 846/9 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
States' Efforts to Detect Duplicate Public Assistance Payments.
17 Sep 81, 23p Rept no. GAO/HRD-81-133

In a June 1979 letter, the former Chairman of the Senate Committee on Finance requested that we: (1) determine which States have or are currently performing intrastate matches of public assistance rolls, (2) determine which States have used the Department of Health and Human Services' (HHS') Interjurisdictional Data Exchange (IDEX) model (for performing matches), (3) select several States and perform various analyses of their AFDC computerized beneficiary records by using identifiers other than just the social security number to detect duplication, and (4) match duplicates found on the AFDC rolls with the Medicaid and Food Stamp computerized beneficiary records to determine the impact on those programs. (Author)

AD-A106 849/3 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Follow-Up Review to Determine the Extent to Which the Department of Health and Human Services has Implemented the Recommendations in Our Report: 'Increased Federal Efforts Needed to Better Identify, Treat, and Prevent Child Abuse and Neglect'.
18 Sep 81, 15p Rept no. GAO/HRD-81-153
See also Rept. no. GAO/HRD-80-66 dated 29 Apr 80.

No abstract available.

AD-A106 891/5 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Inquiry into the Status of a Proposal to Construct 16 Single-Family Detached Homes for the Cuyahoga Metropolitan Housing Authority in Cleveland, Ohio.
30 Jul 81, 7p Rept no. GAO/CED-81-147

The purpose of this review was to examine the status of a proposal to construct 16 single-family detached homes for rental to lower income persons for CMHA. Specifically we gathered and analyzed information on the status of The Dillon Company's proposal to construct the units, actions that must be taken before the proposal is approved by HUD, and preliminary costs proposed by The Dillon Company to construct the units. We made our review at CMHA's headquarters and HUD's office in Cleveland, Ohio. We reviewed project files and interviewed CMHA and HUD officials. We also contacted the person who appraised the proposed project for a Cleveland city councilman. We visited the proposed site of the units and toured the surrounding neighborhood. (Author)

AD-A107 348/5 PC **A03**/MF **A01**
United States International Univ., San Diego, CA. Family Research Center.
Family Roles in Transition. In a Changing Military.
Interim rept.,
Edna J. Hunter, and Melissa A. Pope. 18 Jun 81, 28p Rept no. USIU-TR-81-02
Contract N00014-79-C-0519

The military is no longer a single man's occupation; today there are increasing numbers of married service personnel and active duty women. A review of the literature on changing roles and structures within the military family indicates that although only one member of the marital dyad may actually be employed by the military, this organization places heavy demands upon both marital partners. Although much of the earlier research on this topic outlined proper roles for the traditional military family members, more recent articles focus on changing roles for both men and women in society which are belatedly being reflected within the military, and thus creating new problems for mission accomplishment. Ironically, as the research points out, the military requires independent dependents if the family is to cope successfully with frequent family separations. The major focus of existing research has been problem-oriented and has dealt with the unique stresses placed upon military family members, which require flexibility of family roles. (Author)

AD-A107 349/3 PC **A02**/MF **A01**
United States International Univ., San Diego, CA. Family Research Center.
Military Retention and Retirement. Reciprocal Family/Organization Effects,
Robert A. Hickman, and Edna J. Hunter. 30 Jun 81, 24p Rept no. USIU-TR-81-03
Contract N00014-79-C-0519
See also AD-A093 811.

A review of all research on military families available in 1980 revealed that only recently have the topics of family factors in retention and the effects of retirement on family members been addressed. This article reviews work which has been carried out on spousal attitudes towards the military and the family member's commitment to the organization, work which reviews those two variables as significant influences on the retention decisions of active duty service personnel. Also addressed in the literature are newer areas of interest to researchers such as the retention decisions of active duty women and the focus by military planners on family issues in military mission accomplishment subsequent to the advent of the All Volunteer Force. The literature on retirement from the military after 20 to 30 year careers has centered on the adjustment problems which family members are required to make during this occupational transition, their relative success in coping with this crisis, and the assistance or lack of assistance provided by the military organization in helping the family in its effort to cope.

AD-A107 460/8 PC **A13**/MF **A01**
Illinois Univ. at Urbana-Champaign. Dept. of Psychology.
Interpersonal Relations Among Hispanics in the United States: A Content Analysis of the Social Science Literature.
Interim technical rept.,
Judith Lisansky. Oct 81, 291p Rept no. TR-3
Contract N00014-80-C-0407

This report is a comprehensive review of the social science literature on interpersonal relations among Hispanics in the United States. The materials were content analyzed in terms of a series of dimensions of intercultural variation (Triandis, 1981) which have been found to be highly relevant to interpersonal relations. Topics covered include thought patterns, basic value orientations, aspects of identification and social differentiations. The literature indicates that there is little consensus on many of the dimensions explored and suggests numerous hypotheses for further research. Some authors argue for subcultural differences, others assert that major changes are occurring, and still others warn against attributing specific cultural attributes to Hispanics. Similiarities and differences among the various Hispanic groups were also examined, focusing primarily on Mexican Americans, Puerto Ricans and Cubans. (Author)

AD-A107 535/7 PC **A03**/MF **A01**
Human Resources Research Organization, Alexandria, VA.
The Army Racial Awareness Program: A Case Study of Program Impact on Personal Values.
Special rept.,
Michael R. Vaughan, and Richard E. Kriner. Apr 75, 30p Rept no. HUMRRO-SR-CD(L)-75-2
Contract DAHC19-73-C-0004

The effects of two forms of presentation of the Army Racial Awareness Program (RAP) on the personal values of equality and freedom were assessed. Subjects were army personnel assigned to RAP at Fort Meade, Md. The research instrument was the Rokeach Value Survey, in pretest-posttest administrations. Results suggested that the official RAP presentation version-lecture and discussion-was more effective than a lecture-only version in changing personal values. Importance attached to equality was increased among RAP participants but not among lecture-only subjects. Importance attached to freedom was relatively unaffected in both groups. The size and statistical significance of value change among RAP participants varied according to characteristics such as age, race, rank, and education. Such differences were not found among lecture-only subjects. Subjects indicated approval of the RAP program and its continuance for all Army personnel.

HRP-0903730/0 PC **A02**/MF **A01**
Maine Dept. of Human Services, Augusta. Bureau of Health Planning and Development.
Methodology for Generating Detailed Population Estimates and Projections for the State of Maine: Number 4,
Marianne Messina, Ellen Naor, Suanne Singer, and David Studer. Jan 80, 15p
Contract PHS-HRA-238-78-2128

The method by which age-specified estimates and projections were created for Maine on a state level as well as smaller geographic divisions such as counties, hospital service areas, and regional planning commission jurisdictions is described.

PB82-104969 PC **E04**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
A Methodology for Evaluating Housing in Use: A Case Study Approach,
Stephen T. Margulis. Jun 81, 225p NBSIR-81-2258
Sponsored in part by Department of Housing and Urban Development, Washington, DC. Office of Policy Development and Research. THIS DOCUMENT WAS ANNOUNCED PREVIOUSLY IN ISSUE 8201. It is being reannounced with a price change.

The National Bureau of Standards (NBS) has prepared a report on the methodology of Project Feedback, the evaluation of Operation Breakthrough housing in use (a post-occupancy housing evaluation). The report introduces housing evaluations and encourages their use by providing both housing questionnaires and a nontechnical, practical discussion of research methods in general and of survey research in particular. To increase the sophistication of housing evaluation research designs, the report includes a tested approach for selecting control group respondents for housing evaluations. In addition, it summarizes results of NBS's housing evaluations, principally to illustrate ways of categorizing (coding) occupants' answers, but also to introduce these studies and their results. The case study approach is meant to encourage readers to build on NBS's experiences.

PB82-107533 PC **A13**/MF **A01**
JWK International Corp., Annandale, VA.

Summary and Recommendations: Conference on Pacific and Asian American Families and HEW-Related Issues.
Final rept.
12 May 78, 288p ASPE/E/TA-78-20
Contract DHEW-100-77-0102

The conference used the expertise of the participants to formulate recommendations about those HHS programs having the most impact on the quality of life of Pacific and Asian American families.

PB82-130386 PC **A04**/MF **A01**
Lehigh Univ., Bethlehem, PA.
The Networkers Network: A Study of the Impact of a New Communications Medium on Sociometric Structure.
Final rept. 30 Sep 77-31 Dec 79,
Sue C. Freeman, and Linton C. Freeman. 1981, 74p
Grant NSF-DSI77-16578

Forty social scientists and mathematicians, all concerned with problems in the study of social networks, were linked together by means of a computer to facilitate their interpersonal communication. The present paper presents the early results of this experiment. Interpersonal linkage patterns among participants prior to the start of the experiment were used as a 'base line' from which the impact of this unique medium of communication was examined. The authors attempt to uncover some of the dimensions of sociometric patterns as they have developed through and around the computer based network of networkers.

PB82-131442 PC **A08**/MF **A01**
Nathan (Robert R.) Associates, Inc., Washington, DC.
The Income and Production of Guyana Rural Farm Households: An Analysis Based on the 1979 Guyana Rural Farm Household Survey.
Apr 80, 158p AID-PN-AAH-642
Contract AID-504-INST-781

Obtaining a clear picture of the economic well-being of farm households in Guyana is a prerequisite for providing assistance to the country's poorest and neediest farmers. To this end, the results of a survey of the income and production of Guyana's rural farm households for the year 1978 as derived from interviews of individuals from these families, are presented in this report. Major findings of this report include: (1) four-fifths of rural farm households had annual incomes below Guyana's target level for development assistance; (2) two-thirds of rural farm household income came from off-farm sources; (3) one-third of farm households reported difficulty in obtaining needed production and service inputs for rice production; (4) irrigation systems and conditions were better on non-target farms than on target farms. Based on these findings, the following basic program and policy directives aimed at raising rural farm income are set forth: (1) increasing government support for rural households; (2) encouraging farmers to increase the amount of land under cultivation; (3) improving on-farm water control; (4) creating more opportunities for off-farm employment.

PB82-131491 PC **A06**/MF **A01**
American Public Health Association, Washington, DC.
Third Evaluation of the Thailand National Family Planning Program.
Program evaluation rept. no. 3,
Donald Minkler, and Debhanom Muangman. Feb 80, 125p AID-PN-AAJ-314
Contract AID-pha-C-1100

Since the development of the first family planning (FP) project implemented in Thailand in 1968, great progress has been made there in FP and the use of contraceptives. The NFPP has had the folowing significant impact upon population growth: contraceptive use, especially of the pill, has increased substantially since the commencement of NFPP; fertility is decreasing faster in rural areas than in urban areas; the steady decline in the fertility rates since the mid-1960's has accelerated since NFPP began; and the population growth rate has decreased from 3.6% to 2.6% during 1960-75. For the success of this program to continue, increased support is required from the Royal Thai Government (RTG) and international donors. Other recommendations arising from this evaluation include: (1) giving priority to geographic regions and subpopulations where FP acceptance is low; (2) emphasizing improved management and supervision at the village level; (3) including information about FP in health education programs; (4) giving all health education personnel rural health; (5)evalution the impact of NFPP on health status, (6) continuing pilot projects to determine the use of nonphysician personnel in FP service delivery and (7) continuing subsidy to RTG.

PB82-131558 PC **A07**/MF **A01**
Brookings Institution, Washington, DC.
Case Studies of the Impact of Federal Aid on Major Cities: City of Cleveland.
Final rept.,
Richard F. Tompkins, Peggy Twohig, JoAnn Fitzpatrick, Susan Lajoie, and James Coke. Feb 81, 129p FEDERAL AID CASE STUDIES SER PAPER-10, MEL-81-19
Grant DL-23-11-77-03

The report is one of a series of studies of how particular large cities have used federal aid, with emphasis on the 1977-78 economic stimulus expansion of the federal grants for public service employment, local public works, and antirecession fiscal assistance. The studies use a common analytic framework to enable comparison across cities with differing economic, budgetary, and political circumstances. Each of the studies traces growth and uses of federal aid in the 1970s and seeks to respond to four types of questions: (1) To what extent have cities become dependent on federal grants to pay for basic services. (2) Has the Carter Administration's Economic Stimulus Program of 1977-78 helped reduce unemployment. (3) Who benefits from the federally supported programs. (4) Who at the local level decides how the federal aid money is spent.

PB82-132663 PC **A02**/MF **A01**
Colorado Univ. at Boulder. Natural Hazards Research and Applications Information Center.
Natural Hazards Observer Index. Volume 1, Number 1-Volume 4, Number 3.
Mar 80, 12p NSF/RA-800605
Grant NSF-ENV76-05682
See also Volume 1, Number 1, PB-289 832.

The index covers each issue of the OBSERVER from Volume I, Number 1 in September, 1976 to Volume IV, Number 3 in March, 1980. Each entry indicates the Volume, Number, and Page on which the item can be found. To be of maximum utility, the index is divided into three parts: author index--all authors and receivers of grants; title index--all books, studies and articles; and subject index--all topics ever mentioned.

PB82-132796 PC **A09**/MF **A01**
Daytop Village, Inc., New York.
Advancement in Drug Free Therapeutic Community Treatment.
Evaluation rept.,
D. Vincent Biase. Mar 81, 190p
Sponsored in part by National Inst. on Drug Abuse, Rockville, MD.

Daytop Village's Miniversity is an experiment which represents a significant advancement in the type of educational program available in therapeutic communities. Therapeutic communities develop educational programs for three primary reasons. First, and most simply, education is valued in and of itself. At a more practical level, therapeutic communities develop educational programs because they seem essential to re-entry. Third, educational programs are viewed as an adjunct to treatment. Like the other educational programs offered at therapeutic communities, Daytop's Miniversity grew from these rationales. The Miniversity, however, was designed to go beyond these programs and to fill a gap in them. This survey of thirteen major T.C. programs represented nine states with significant numbers of treatment slots for the drug free residential modality/environment. The States represented were New York; California; Pennsylvania; Illinois; Michigan; Massachusetts; Connecticut; New Jersey and Rhode Island. The average age of residents ranged from 14.5 years to 27 years.

PB82-133232 PC **A14**/MF **A01**
International Center for Research on Women, Washington, DC.
A Preliminary Study in Three Countries: Indonesia Report,
Pauline Milone. Sep 78, 306p AID-PN-AAH-417
Grant AID/otr-G-1477

In Indonesia, a country of over 300 ethnic groups, the enormous diversity of language, religion, education, culture, and custom makes the term Indonesian woman inadequate. This paper documents the social, legal, and economic status of Indonesia's 66 million women without neglecting ethnic differences. The first section describes the country's Islamic, Christian, and commonlaw marriage customs, which impact on every aspect of a woman's existence. The history of Indonesia's women's movement, especially in eliminating child and forced marriages, polygamy, and husband-initiated arbitrary divorce are discussed. This is followed by a portrayal of the difficulties faced by women - particularly the young and/or unmarried - in achieving equal status under the law in regard to child custody, property ownership, control of income, tax liability, access to credit, political participation, and educational opportunities. Also included are the many factors responsible for the high rates of female anemia/malnutrition and maternal mortality, women's communications networks, economic and demographic profiles of women, and the author's impressions of the effects of modernization on women.

PB82-133380 PC **A04**/MF **A01**
Washington Univ., Seattle.
Rape Reporting: Causes and Consequences,
Shirley Feldman-Summers. Nov 79, 59p NIMH-81-45
Grant PHS-R01-MH-27830

Two studies on the causes and consequences of reporting, or not reporting, a rape were conducted. In the first study 400 potential victims from four ethnic communities (100 each Anglo, Asian-American, Black and Hispanic) were interviewed regarding intention to report, if raped. Replies varied according to ethnic identity. In the second study 179 rape victims who did or did not report the crime were interviewed. Actual outcomes experienced following the decision to report or not report are discussed.

PB82-133539 PC **A03**/MF **A01**
National Bureau of Standards, Washington, DC.
Results of Fingerprint Image Quality Experiments,
R. T. Moore. Jun 81, 50p NBSIR-81-2298
Sponsored in part by Federal Bureau of Investigation, Washington, DC.

A series of experiments were conducted to determine the variation in the scores developed using a matching algorithm designated as the M-82 for mating fingerprints of different image quality that had been read by the Automatic Fingerprint Reader System (AFRS) of the FBI. The variations in image quality resulted from the use of a variety of card stocks and recording techniques to record the print of a single finger. For each image recording process, a sample of 56 finger-pairs were matched and mean single-finger score values were developed. These varied over a factor of more than 70 to one. The best scores were developed from images placed on very white, slick appearing, calendared card stock with the use of film strips that had been pre-inked and which could be separated to expose an ink film of predetermined thickness and uniformity. This combination had less resistance to smearing than fingerprints produced on the same stock from the use of a preinked porous pad. However, the latter still produced acceptably high scores.

PB82-134297 PC **A02**/MF **A01**
Intermountain Forest and Range Experiment Station, Ogden, UT.
Trends in Recreational Use of National Forest Wilderness.
Forest Service research note,
Margaret Peterson. Aug 81, 6p FSRN-INT-319

Trends in recreational use are useful as predictors of the need for future management decisions. As more land has been added to the National Forest Wilderness System, increases in use have occurred primarily on areas established by 1965. Visitor use of the areas designated by 1965 has been increasing at an average rate of 4 percent per year.

PB82-137027 PC **A12**/MF **A01**
Swedish Council for Building Research, Stockholm.
Housing Demand Models and Housing Market Models for Regional and Local Planning,
Bjoern Harsman. 1981, 268p D13:1981, ISBN-91-540-3538-X

The authority mainly responsible for housing provision in Sweden is the local government. Every year each municipality has to work out a program for the development of the housing stock during the next five years. These plans are then used by the national government to decide on an upper limit for the future volume of

housing investment in different regions. The major purpose of this study is to offer methods that can be used in housing planning at the local and regional level. A disaggregated approach is used. Housing is regarded as an indivisible commodity characterized by several attributes and different household categories are distinguished. A model package is presented which consists of a household formation model, a housing demand model and a model for depicting the competition in the housing market. An exogenous population forecast at the regional level is the basis for the model package. The number of dwellings demanded is obtained by the household formation model and the demand model spells out what dwelling types various households demand. In the housing market model this demand is confronted with an exogenously given supply. The output is a pattern of housing consumption and a set of variables indicating imbalances in the market.

PB82-139122 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Requests for Federal Disaster Assistance Need Better Evaluation.
Report to the Congress.
Dec 81, 66p CED-82-4

Since 1970 the President's Disaster Relief Fund has provided over $3.8 billion to individuals and State and local governments. The Federal Emergency Management Agency, in assessing eligibility for disaster assistance, has had difficulty in determining whether State and local governments are capable of handling their own disasters and whether they are committing a reasonable amount of their available funds for disaster relief. GAO also found that the Agency has adopted a controversial cost-sharing policy and has funded other than natural disasters. GAO recommends that the Congress clarify (1) the extent of supplemental Federal assistance to be given and (2) what kinds of disasters are eligible for Federal assistance. The Federal Emergency Management Agency should analyze the impact potential State inequities have on Federal disaster assistance and submit a detailed plan and legislative changes to the Congress to correct such weaknesses.

PB82-139148 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. General Government Div.
Stronger Federal Effort Needed in Fight Against Organized Crime.
7 Dec 81, 93p GGD-82-2

Organized crime is flourishing despite an improved strike force program. The Department of Justice has successfully indicted and prosecuted many high level crime figures, but a stronger Federal attack is needed.

PB82-141250 PC **A13**/MF **A01**
Harris (Louis) and Associates, Inc., New York.
A Survey of Citizen Views and Concerns About Urban Life.
Final rept.
Feb 78, 284p STUDY-P2795
Contract HUD-H-2835
Supersedes PB-300 154.Portions of this document are not fully legible.

The American city is the place in which society's economic, cultural, and intellectual needs--though not its residential needs--can best be met. That is one of the interesting findings that have resulted from this survey of citizen views about urban life conducted by Louis Harris and Associates. The survey, completed in January 1978, provided citizen input into the President's 1978 report to the Congress on urban policy. More than 7,000 citizens in urban, suburban, and rural areas throughout the country were asked to give their views on the present condition and future prospects of their communities. This publication, here reprinted, outlines the survey's general findings.

PB82-144296 PC **A22**/MF **A01**
Environmental Research and Development Foundation, Tucson, AZ.
Post Occupancy Evaluation of Housing.
Final rept.,
Robert B. Bechtel, and Rajendra K. Srivastava. Dec 78, 521p HUD-0000815
Contract HUD-H-2405

Post occupancy Evaluations (POE's) are evaluations made to buildings after they have been occupied for some length of time. They are evaluations from the viewpoint of the people who use the building, including residents, visitors, managers, and maintenance personnel. This report deals with POE's of housing for HUD and is organized into 14 tasks. Study results revealed that although over 1,000 professionals were surveyed throughout the United States, only 31 housing agencies had ever done POE's and of these, not a single one had incorporated POE's within their programs. A total of 499 persons and 169 organizations were found to have expertise in performing POE's. Of the 1,305 studies reviewed, only 265 in the United States had sufficient data for analysis. Most of the 265 were conducted in the northeastern States and California. Lack of involvement by housing - related professionals with housing after it has been built was seen as the most relevant constraint to use of POE's. Current attitudes toward POE's show that POE's should cover health and safety first and that POE's primary objective should be to improve future housing design. A clearinghouse strategy is proposed to identify, develop, and overcome past constraints to the use of POE's. POE's are outlined for HUD's largest programs: Multifamily Mortgage Insurance, Section 8 New Construction, and Turnkey Public Housing. The report recommends that POE training packages should be developed and that HUD should mandate the use of POE's in all housing programs. About 90 tables, 8 figures, and 7 exhibits are included. Five appendices list individuals and organizations with POE expertise, an international bibliography of POE evaluations, a POE questionnaire, a POE fact sheet, and POE topics. (Author abstract modified).

PB82-144312 MF **A01**
Philadelphia Geriatric Center, PA.
Annual Housing Survey: 1973. Housing Characteristics of Older Americans in the United States.
Aug 79, 226p HUD-0000947, HUD/PDR-501/1
Sponsored in part by Administration on Aging, Washington, DC.
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 023-000-00535-2.

Data from the 1973 Annual Housing Survey conducted by HUD are used as the basis for this report presenting detailed statistics on the housing characteristics and neighborhood conditions for all U.S. households headed by persons aged 62 - 64 and 65 and over. Data for the housing and household characteristics are shown by standard metropolitan statistical areas, income level, value of owned housing units, gross rent categories, and characteristics of recent movers. About one - fifth of the 69.3 million occupied housing units in the United States in 1973 were households headed by a person aged 65 or older. Of these households, over 9.3 million were owner - occupied and 4 million were occupied by renters. The main type of housing for households headed by older persons was the single - family home. The majority of the dwellings for this age group were built in 1939 or earlier. Almost one - tenth of the renter - occupied dwellings lacked some or all plumbing facilities. Owner - occupied units had about 1.5 times the number of rooms as renter - occupied units. Street noise and heavy traffic were the most common neighborhood problems cited. Housing occupied by recent movers tended to be newer than the other housing. Change in housing needs was most often cited as the motivation for moving to a different dwelling. Family status was the second most common reason and included such factors as becoming widowed, moving closer to relatives, and a decrease in family size. Extensive tables and appendices presenting the study instrument and background information on the study design are provided. (Author abstract modified).

PB82-144387 PC **A06**/MF **A01**
University of Southern California, Los Angeles. The Planning Inst.
Women and Mortgage Credit: An Annotated Bibliography,
Emily Card. Mar 79, 110p HUD-0001714
Contract HUD-H-5250-79

The second section of a two - part report, this work consists of an annotated bibliography of agency information packages and the results of a literature search of materials dealing with housing and mortgage credit for women. The report summarizes the state - of - the - art of Federal agencies charged with Equal Credit Opportunity Act enforcement. To obtain the citations listed herein, an extensive search was made of numerous sources. Approximately 20,000 entries were scanned in the Library of Congress centralized bibliographic indexes, several computer - based information systems were accessed, and agencies with enforcement responsibilities were contacted. Private organizations, public interest grups, and congressional staff members were also queried The search revealed that the number of journal articles, monographs, or Government publications relating directly to women and mortgage loans or housing problems was limited. Rather, most sources on housing and mortgage discrimination dealt with the issue of race discrimination and redlining. Sources identified herein are grouped according to the following subject categories: mortgages, housing and home ownership, consumer credit, enforcement of nondiscriminatory credit practices, families, women in the economy, banking, statutes, and bibliographies. Descriptors, where appropriate, have been added, and some reference materials have been cited without annotations. Recent entries are emphasized. Several recurring themes are apparent in the bibliography. For example, women's income levels are a critical factor in assessing women's access to the housing market. In major metropolitan areas, an income of almost $20,000 is needed annually for a median - priced house purchase, yet one study showed that 50 percent of all working women make less than $6,000 per year. The picture is somewhat bleaker for the female single parent; one - third of families headed by women are below the poverty level. In addition, lending practices tend to be overly conservative in view of women's present economic role, particular regarding the income potential of families with working husbands and wives. In general, women's participation in housing purchases has been insufficiently charted and evaluated. The extensive bibliography, with most reference works published between 1972 - 78, constitutes the bulk of the report.

PB82-144403 PC **A02**/MF **A01**
American Bar Association, Washington, DC. National Housing Justice and Field Assistance Program.
National Housing Justice and Field Assistance Program. Quarterly Information Bulletin, Issue Five, Fall 1980.
1980, 10p HUD-0001816
Sponsored in part by Federal Emergency Management Agency, Washington, DC.

Issues bearing upon housing and building fire safety are reported in this edition of a quarterly information bulletin concerned with justice for consumers in housing. A study of building code enforcement with emphasis on fire and life safety is announced. This national study is sponsored jointly by the American Bar Association and the U.S. Fire Administration / Federal Emergency Management Agency. The primary focus of the study will be on fire and life safety components of local and State codes. Initial operation of the National Center for Community Code Compliance is also reported. This organization offers funding and technical assistance for communities and groups concerned about upgrading fire and life safety codes and their enforcement within their jurisdictions. A segment presented by the International Association of Fire Chiefs advises that in a climate of reduced resources for fire departments, emphasis must be placed on fire prevention, primarily through the effective formulation and enforcement of fire codes. Among other issues and programs examined are legal considerations in retrospective building regulations and a fire inspection management guidelines project.

PB82-144411 PC **A12**/MF **A01**
Abt Associates, Inc., Cambridge, MA.
Housing Deprivation Among Enrollees in the Housing Allowance Demand Experiment.
David W. Budding. Jun 80, 257p AAI-78/133, HUD-0001839
Contract HUD-H-2040R

The incidence and nature of housing deprivation are described for low - income and poverty renters at the time of their enrollment in the Housing Allowance Demand Experiment, a test of the concept of direct cash assistance to low - income households enabling them to rent suitable housing. The experiment tested a variety of allowance plans involving about 1,200 experimental households and 500 control households at two sites (Allegheny County, Pa., and Maricopa County, Ariz.) during 1973 - 1977. Each household enrolled in the experiment was offered allowance payments for 3 years. Analysis is based on data from the first 2 years. This report's focus is on physical housing deprivation of clients' housing at the time of enrollment. Each dwelling unit was inspected by a trained

evaluator. By gathering extensive information on the physical condition of dwelling units through this method, estimates of inadequate housing sharply increased over those produced by traditional measures. The incidence of housing deprivation, crowding, and rent burden were found to be related to household size and income, with the incidence of housing deprivation being greatest among the very poor. Traditional measures of crowding and rent burden are also indicated to be inadequate. Tabular and graphic data, footnotes, and chapter references are provided. Appended material explains the design of the demand experiment, the development of the measure used, housing needs, and site detail. (Author abstract modified).

PB82-144460 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey 1978. United States and Regions. Housing Characteristics of Recent Movers.
May 81, 178p HUD-0002051
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-02676-7.

This report presents cross - tabulations on the housing characteristics of units occupied by 'recent movers' from the 1978 Annual Housing Survey. Statistics are presented for the United States by inside and outside standard metropolitan statistical areas (SMSA's) and each of the four geographic regions. Households that moved into their units during the 12 months prior to the interviews are classified as recent movers. Individual tables present characteristics of all occupied housing units and units occupied by recent movers. They also give data for 'specified owner occupied,' recent mover households cross - tabulating family and primary individual income by the purchase price of the recently acquired home. Other tables present characteristics of the present unit for recent mover households cross - tabulated by the characteristic of the previous unit. The same subject content in these tables is presented for housing units with black heads of households and for housing units with heads of households of Spanish origin. Appendices describe the geographic area classifications and provide definitions and explanations of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of data. Maps are provided. (Author abstract modified).

PB82-144486 PC **A05**/MF **A01**
Urban Inst., Washington, DC.
Fair Market Rents (FMRs) for Existing Dwellings: An Evaluation Through Hedonic Index Methods,
Larry Ozanne, and Thomas Thibodeau. May 81, 77p HUD-0002054
Contract HUD-H-2882

Findings are reported from an application of hedonic index methods to an evaluation of 'fair market rents' (FMR's) in the existing housing portion of Section 8 of the 1974 Housing and Community Development Act, which authorizes housing assistance payments for lower income families. HUD is charged with establishing FMR's for dwellings appropriate for assisted families. HUD currently sets unit FMR's for each Standard Metropolitan Statistical Area (SMSA) and for each nonmetropolitan county, using the metropolitan Annual Housing Survey (AHS) to provide the basic data. Median rent for recently occupied two - bedroom units without defects is obtained from each SMSA survey and updated by the Consumer Price Index. FMR's for bedroom sizes other than two are set by using a 15 - percent differential per bedroom. The proposed hedonic method yields a site - specific formula for predicting average market rents at all bedroom sizes for each SMSA, using data from the AHS. The formula tests the statistical importance of adjustments to market rents representing central city or suburban locations, single family or multifamily buildings, as well as many other distinctions. The hedonic index method also provides ranges of probable error for all predicted rents. The comparison of FMR schedules from the hedonic method with actual FMR's shows that HUD's median rent procedure leads to an overstatement of the market rent for dwellings meeting Section 8 housing standards. On average, HUD's 15 - percent bedroom differential permits additional space and features beyond another bedroom. The hedonic procedure can be used to set differentials reflecting additional bedrooms and other necessary additions. Rental price differences among SMSA's are analyzed, and a model of metropolitan housing markets is presented. A reduced form equation for rental prices is also estimated. Tabular data are supplied, and supplementary information is appended. Seven references are listed.

PB82-144650 PC **A07**/MF **A01**
Artists Foundation, Inc., Boston, MA.
Artists' Spaces: A Study of the Development of Artists' Living and Working Space in Boston,
Theodore C. Landsmark. 01 Mar 81, 138p HUD-0002076
Grant HUD-H-5124RG

This report on the efforts of the Artists Foundation to develop affordable living and working spaces for artists in the greater Boston area explains how deteriorating neighborhoods can be revitalized by converting vacant warehouse and industrial buildings into artists' lofts and studios. The history and justification for the connection between the arts community and neighborhood revitalization are examined, along with the advantages and disadvantages of concentrating artists within neighborhoods. An assessment of the requirements for space for various sectors of the arts community shows that the building selected for studio loft space should have central stairways, easy - to - follow common hallways, freight elevators, and fire escapes. The overall floor plan should include from 1,500 square feet to 3,000 square feet of high - ceilinged space per artist. Each floor should be equipped with common conveniences for collective use. The case study of the foundation's Art Space Project, Inc., delineates the problems encountered and solutions found to converting the building at 86 South Street, Boston, into condominiums providing artists with living and working space. The completion and full occupancy of the project without public subsidies serves as a model of what can be accomplished through creative development. A bibliography of about 200 references, the artists space survey findings, plans for 86 South Street, financing strategies, and other related material are appended.

PB82-144668 MF **A01**
Real Estate Research Corp., Chicago, IL.
Selling the Solar Home '80: Market Findings for the Housing Industry.
Jan 80, 36p HUD-0002077, HUD/PDR-514
Contract HUD-H-2372
Sponsored in part by the Department of Energy, Washington, DC.
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 023-000-00568-9.

This is the second report on marketing experiences in the HUD residential solar heating and cooling demonstration program, which supports many different types of solar projects and collects data on their performance and on the experiences of builders in marketing these projects. The study of market factors affecting the acceptance and sale of solar homes is intended to assist and encourage builders interested in including solar energy in future projects. The data are based on a small sample of HUD projects awarded in three cycles between January 1976 and May 1977. The market data collection process involved field visits to each site and comprehensive interviews with key actors in the construction and marketing process; with local government officials in the building code department, tax assessor's office, and zoning agency; and with the purchasers of the solar homes. For comparison purposes, interviews were also held with builders and buyers of conventional homes. Followup interviews were held with the purchasers of the solar homes at 6 - month intervals to determine levels of satisfaction, obtain information on energy use and utility costs, and identify attitudes toward solar energy. Questions were also asked about the operation, performance and maintenance of the solar systems. The solar outlook is seen as encouraging, with three - quarters of builders willing to construct additional solar homes outside the HUD program. The trend has shifted from active to passive solar design. Further study is recommended to determine frequency and cost of repairs and to document energy savings and relate these savings to operating expenses and the initial system cost. Illustrations and tabular data are provided.

PB82-144718 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Albany, Schenectady, Troy, N.Y. Standard Metropolitan Statistical Area.
Aug 80, 378p HUD-0002087
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-0294-7.

This report presents statistics on housing and household characteristics in the Albany - Schenectady - Troy, N.Y., Standard Metropolitan Statistical Area (SMSA). These statistics were derived from the 1977 - 78 Annual Housing Survey conducted in 20 selected SMSA's. The source of 1970 data shown in the report is tabulations from the 1970 Census of Population and Housing, and 1974 data were derived from the 1974 Annual Housing Survey. The report provides statistics on general housing characteristics for 1977, 1974, and 1970 and on indicators of housing and neighborhood quality for 1977. Additionally, housing characteristics cross - classified by indicators of housing and neighborhood quality for 1977. Additionally, housing characteristics are given for black and Spanish heads of households. Statistics also illustrate the changes that have occurred in the housing stock of this SMSA from 1974 to 1977. For example, a net gain of 10,200 housing units has been recorded since 1974, with about 4 percent of the total housing stock constructed since the 1975 survey. Appendices describe the geographic area classifications and provide definitions and explanations of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of the data. Table finding guides and area maps also included. (Author abstract modified).

PB82-144726 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Los Angeles - Long Beach, Calif. Standard Metropolitan Statistical Area.
Aug 80, 588p HUD-0002088
Paper copy available from Supt. of Docs. Washington, DC, 20402, order number 003-024-02100-5.

This report presents statistics on housing and household characteristics in the Los Angeles - Long Beach, Calif., Standard Metropolitan Statistical Area (SMSA). These statistics were derived from the 1977 - 78 Annual Housing Survey conducted in 20 selected SMSA's. The source of 1970 data shown in the report is tabulations from the 1970 Census of Population and Housing, and 1974 data were derived from the 1974 Annual Housing Survey. The report provides statistics on general housing characteristics for 1977, 1974, and 1970 and on indicators of housing and neighborhood quality for owner - occupied and renter - occupied housing units, on financial characteristics, on recent mover households, and on financial characteristics cross - classified by indicators of housing and neighborhood quality for 1977. Additionally, housing characteristics are given for black and Spanish heads of households. Statistics also illustrate the changes that have occurred in the housing stock in this SMSA from 1974 to 1977. For example, a net gain of 28,200 housing units has been recorded since 1974, as well as a net loss of 8,800 unspecified units. Appendices describe the geographic area classifications and provide definitions and explanations of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of the data. Table finding guides and area maps are also included. (Author abstract modified).

PB82-144734 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Madison, Wis. Standard Metropolitan Statistical Area.
Nov 80, 321p HUD-0002089
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-02113-7.

This report presents statistics on housing and household characteristics in the Madison, Wis., Standard Metropolitan Statistical Area (SMSA). These statistics were derived from the 1977 - 78 Annual Housing Survey conducted in 20 selected SMSA's. The source of 1970 data shown in the report is tabulations from the 1970 Census of Population and Housing, and 1974 data were derived from the 1975 Annual Housing Survey. The report provides statistics on general housing characteristics for 1977, 1975, and 1970 and on indicators of housing and neighborhood quality for owner - occupied and renter - occupied housing units, on financial characteristics, on recent mover households, and on financial characteristics cross - classified by indicators of housing and neighborhood quality for 1977. Additionally, housing characteristics are given for black and Spanish heads of households. Statistics also illustrate the changes that have occurred in the housing stock of this SMSA from 1975 to 1977. For example, a net gain of 7,100 housing units has been recorded since 1975, with about 6 percent of the total

housing stock constructed since the 1975 survey. Appendices describe the geographic area classifications and provide definitions and explanations of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of the data. Table finding guides and area maps are also included. (Author abstract modified).

PB82-144742 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Newark, N.J. Standard Metropolitan Statistical Area.
May 80, 583p HUD-0002090
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-02103-0.

This report presents statistics on housing and household characteristics in the Newark, N.J., Standard Metropolitan Statistical Area (SMSA). These statistics were derived from the 1977 - 78 Annual Housing Survey conducted in 20 selected SMSA's. The source of 1970 data shown in the report is tabulations from the 1970 Census of Population and Housing, and 1974 data were derived from the 1974 Annual Housing Survey. The report provides statistics on general housing characteristics for 1977, 1975, and 1970 and on indicators of housing and neighborhood quality for owner - occupied and renter - occupied housing units, on financial characteristics, on recent mover households, and on financial characteristics cross - classified by indicators of housing and neighborhood quality for 1977. Additionally, housing characteristics are given for black and Spanish heads of households. Statistics also illustrate the changes that have occurred in the housing stock of this SMSA from 1974 to 1977. For example, a net gain of 6,500 housing units has been recorded since 1974, with about 2 percent of the total housing stock constructed since the 1974 survey. Appendices describe the geographic area classifications and provide definitions and explanations of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of the data. Table finding guides and area maps are also included. (Author abstract modified).

PB82-144759 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Orlando, Fla. Standard Metropolitan Statistical Area.
Oct 80, 531p HUD-0002091
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-02104-8.

This report presents statistics on housing and household characteristics in the Orlando, Fla., Standard Metropolitan Statistical Area (SMSA). These statistics were derived from the 1977 - 78 Annual Housing Survey conducted in 20 selected SMSA's. The source of 1970 data shown in the report is tabulations from the 1970 Census of Population and Housing, and 1974 data were derived from the 1974 Annual Housing Survey. The report provides statistics on general housing characteristics for 1977, 1975, and 1970 and on indicators of housing and neighborhood quality for owner - occupied and renter - occupied housing units, on financial characteristics, on recent mover households, and on financial characteristics cross - classified by indicators of housing and neighborhood quality for 1977. Additionally, housing characteristics are given for black and Spanish heads of households. Statistics also illustrate the changes that have occurred in the housing stock of this SMSA from 1974 to 1977. For example, a net gain of 16,500 housing units has been recorded since 1974, with about 7 percent of the total housing stock constructed since the 1974 survey. Appendices describe the geographic area classifications and provide definitions and explanations of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of the data. Table finding guides and area maps are also included. (Author abstract modified).

PB82-144767 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Phoenix, Ariz. Standard Metropolitan Statistical Area.
Sep 80, 544p HUD-0002092
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-02105-6.

This report presents statistics on housing and household characteristics in the Phoenix, Ariz., Standard Metropolitan Statistical Area (SMSA). These statistics were derived from the 1977 - 78 Annual Housing Survey conducted in 20 selected SMSA's. The source of 1970 data shown in the report is tabulations from the 1970 Census of Population and Housing, and 1974 data were derived from the 1974 Annual Housing Survey. The report provides statistics on general housing characteristics for 1977, 1974, and 1970 and on indicators of housing and neighborhood quality for owner - occupied and renter - occupied housing units, on financial characteristics, on recent mover households, and on financial characteristics cross - classified by indicators of housing and neighborhood quality for 1977. Additionally, housing characteristics are given for black and Spanish heads of households. Statistics also illustrate the changes that have occurred in the housing stock of this SMSA from 1974 to 1977. For example, a net gain of 53,600 housing units has been recorded since 1974, with about 10 percent of the total housing stock constructed since the 1974 survey. Appendices describe the geographic area classifications and provide definitions and explanations of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of the data. Table finding guides and area maps are also included. (Author abstract modified).

PB82-144775 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Saginaw, Mich. Standard Metropolitan Statistical Area.
Oct 80, 580p HUD-0002093
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-02196-2.

This report presents statistics on housing and household characteristics in the Saginaw, Mich., Standard Metropolitan Statistical Area (SMSA). These statistics were derived from the 1977 - 78 Annual Housing Survey conducted in 20 selected SMSA's. The source of 1970 data shown in the report is tabulations from the 1970 Census of Population and Housing, and 1974 data were derived from the 1974 Annual Housing Survey. The report provides statistics on general housing characteristics for 1977, 1975, and 1970 and on indicators of housing and neighborhood quality for owner - occupied and renter - occupied housing units, on financial characteristics, on recent mover households, and on financial characteristics cross - classified by indicators of housing and neighborhood quality for 1977. Additionally, housing characteristics are given for black and Spanish heads of households. Statistics also illustrate the changes that have occurred in the housing stock of this SMSA from 1974 to 1977. For example, a net gain of 2,200 housing units has been recorded since 1974, with about 4 percent of the total housing stock constructed since the 1974 survey. Appendices describe the geographic area classifications and provide definitions and explanations of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of the data. Table finding guides and area maps are also included. (Author abstract modified).

PB82-144783 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Salt Lake City, Utah. Standard Metropolitan Statistical Area.
Oct 80, 439p HUD-0002094
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-02108-1.

This report presents statistics on housing and household characteristics in the Salt Lake City, Utah, Standard Metropolitan Statistical Area (SMSA). These statistics were derived from the 1977 - 78 Annual Housing Survey conducted in 20 selected SMSA's. The source of the 1970 data shown in the report is tabulations from the 1970 Census of Population and Housing, and 1974 data were derived from the 1974 Annual Housing Survey. The report provides statistics on general housing characteristics for 1977, 1974, and 1970 and on indicators of of housing and neighborhood quality for owner - occupied and renter - occupied housing units, on financial characteristics, on recent mover households, and on financial characteristics cross - classified by indicators of housing and neighborhood quality for 1977. Additionally, housing characteristics are given for black and Spanish heads of households. Statistics also illustrate the changes that have occurred in the housing stock constructed since the 1974 survey. Appendices describe the geographic area of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of the data. Table finding guides and area maps are also included. (Author abstract modified).

PB82-144791 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Tacoma, Wash. Standard Metropolitan Statistical Area.
Oct 80, 494p HUD-0002095
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-02110-2.

This report presents statistics on housing and household characteristics in the Tacoma, Wash., Standard Metropolitan Statistical Area (SMSA). These statistics were derived from the 1977 - 78 Annual Housing Survey conducted in 20 selected SMSA's. The source of 1970 data shown in the report is tabulations from the 1970 Census of Population and Housing, and 1974 data were derived from the 1974 Annual Housing Survey. The report provides statistics on general housing characteristics for 1977, 1975, and 1970 and on indicators of housing and neighborhood quality for owner - occupied and renter - occupied housing units, on financial characteristics, on recent mover households, and on financial characteristics cross - classified by indicators of housing and neighborhood quality for 1977. Additionally, housing characteristics are given for black and Spanish heads of households. Statistics also illustrate the changes that have occurred in the housing stock of this SMSA from 1974 to 1977. For example, a net increase of 16,100 housing units has been recorded since 1974, with about 10 percent of the total housing stock constructed since the 1974 survey. Appendices describe the geographic area classifications and provide definitions and explanations of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of the data. Table finding guides and area maps are also included. (Author abstract modified).

PB82-144809 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Washington, D.C.-Md.-Va. Standard Metropolitan Statistical Area.
Mar 80, 584p HUD-0002096
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-02111-1.

This report presents statistics on housing and household characteristics in the Washington, D.C. - Maryland - Virginia Standard Metropolitan Statistical Area (SMSA). These statistics were derived from the 1977 - 78 Annual Housing Survey conducted in 20 selected SMSA's. The source of 1970 data shown in the report is tabulations from the 1970 Census of Population and Housing, and 1974 data were derived from the 1974 Annual Housing Survey. The report provides statistics on general housing characteristics for 1977, 1975, and 1970 and on indicators of housing and neighborhood quality for owner - occupied and renter - occupied housing units, on financial characteristics, on recent mover households, and on financial characteristics cross - classified by indicators of housing and neighborhood quality for 1977. Additionally, housing characteristics are given for black and Spanish heads of households. Statistics also illustrate the changes that have occurred in the housing stock of this SMSA from 1974 to 1977. For example, a net gain of 58,200 housing units has been recorded since 1974, with about 5 percent of the total housing stock constructed since the 1974 survey. Appendices describe the geographic area classifications and provide definitions and explanations of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of the data. Table finding guides and area maps are also included. (Author abstract modified).

PB82-144817 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Wichita, Kans. Standard Metropolitan Statistical Area.
Nov 80, 445p HUD-0002097
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-02112-9.

This report presents statistics on housing and household characteristics in the Wichita, Kans., Standard Metropolitan Statistical Area (SMSA). These statistics were derived from the 1977 - 78 Annual Housing

Survey conducted in 20 selected SMSA's. The source of 1970 data shown in the report is tabulations from the 1970 Census of Population and Housing, and 1974 data were derived from the 1974 Annual Housing Survey. The report provides statistics on general housing characteristics for 1977, 1975, and 1970 and on indicators of housing and neighborhood quality for owner - occupied and renter - occupied housing units, on financial characteristics, on recent mover households, and on financial characteristics cross - classified by indicators of housing and neighborhood quality for 1977. Additionally, housing characteristics are given for black and Spanish heads of households. Statistics also illustrate the changes that have occurred in the housing stock of this SMSA from 1974 to 1977. For example, a net gain of 11,000 housing units has been recorded since 1974, with about 8 percent of the total housing stock constructed since the 1974 survey. Appendices describe the geographic area classifications and provide definitions and explanations of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of the data. Table finding guides and area maps are also included. (Author abstract modified).

PB82-144825 MF **A01**
Rutgers - The State Univ., New Brunswick, NJ. Center for Urban Policy Research.
Effect of Race on Opinions of Structure and Neighborhood Quality,
Stephen C. Casey. Nov 80, 61p HUD-0002098, HUD/PDR-625
Contract HUD-H-2429-78
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 023-000-00655-3

Data from the Annual Housing Survey were used to examine racial variation in opinions of housing and neighborhood quality to determine whether they result from differences in attitude between whites and blacks within similar houses or neighborhoods. The study compared white and black mean ratings within the major tenurial categories, owner and renter, using regression equations for each race for owner and renter specification of structure and neighborhood quality. In addition, two analyses of specific variables, value of the structure and the neighborhood variable, were conducted. Results indicate that opinions of housing and immediate geographic area were significantly higher for whites than for blacks. These differences range from one - third to one - half of a point on a 4 - point scale. However, using regression equations reduces the race effect to a relatively insignificant level of about 0.15. Thus, overall, whites and blacks of similar income, housing amenities, and education report the conditions of the housing and neighborhood they occupy similarly. This is true for both owners and renters. Further analysis reveals that there appears to be no difference attributable solely to race in either owners' or renters' specification of housing quality. Thus, this result rebuts the theories that claim the existence of an inherent racial bias in expressed opinion of structure and neighborhood quality. Tables, 17 footnotes, and four references are supplied. Technical data are appended. (Author abstract modified).

PB82-144833 MF **A01**
MKGK, Inc., San Francisco, CA.
Assessment of Urban County Performance: Community Development Block Grant Program.
Aug 80, 536p HUD-0002099, HUD/PDR-660
Contract HUD-H-2606
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 023-000-00686-3

This report contains findings from a performance evaluation of urban counties participating in the Community Development Block Grant (CDBG) program. The research project assessed the performance of urban counties during their first 3 program years (1975 - 77) and involved onsite data collection in all 76 counties. In addition, an update study assessed urban county performance in the next 3 program years (1978 - 80). The original study resulted in these major thematic findings (1) the intergovernmental context of the urban county CDBG program presented major challenges and required substantial intergovernmental cooperation, (2) urban counties served primarily as a funding mechanism for nonentitlement cities, (3) urban counties were unable to develop and implement programs through a comprehensive planning process, (4) urban counties initially restrained their institutional commitments to the CDBG program, and (5) certain conditions which constrained urban county performance appeared to be changing so that continued improvement could be expected. The update analysis found that broad - based improvement was achieved by the 10 sampled counties in their performance levels, although performance remained modest in certain program aspects; and that most of the improvement in urban county performance can be traced to the increased CDBG experience of county and municipal program administrators coupled with new HUD regulations and policy directives. The report recommends that the Interlocal Cooperation Agreement (ICA) be strengthened by including provisions for cooperating jurisdictions' certification of acceptance and responsibility for Housing Assistance Plan (HAP) existing and new unit programs, certification of compliance with various Federal standards, and assurance of maximum feasible priority given to projects which will benefit low - income and moderate - income persons. Tables, figures, and appendices containing a description of project methodology, supporting data, and the service area method for calculating benefit to low - income and moderate - income areas are supplied.

PB82-144841 MF **A01**
Department of Housing and Urban Development, Washington, DC. Office of Policy Development and Research.
Fiscal Year 1981 Research and Technology Program.
1980, 70p HUD/PDR-416/2, HUD-0002101
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 023-000-00652-9.

This brochure details the major areas of the 1981 Research and Technology Budget submitted by the HUD Office of Policy Development and Research. These areas include research in housing assistance, housing safety and standards, consumer and equal opportunity, and community develoment, as well as housing economic data and analyses. In addition, the budget addresses energy conservation and standards research, program evaluation, and research program support and utilization. Program achievements have included the institution of a process for establishing research priorities, the engagement of noted scholars to reexamine the scope, quality, and gaps in existing research, and the improvement of career staff standards. Other achievements have included the introduction of visiting scholars for 1 - year terms, active involvement in research design and analysis of findings, and encouragement of participation by researchers in academic institutions. In addition, a substantially greater effort was made to disseminate research findings and to involve women and minorities in staff work and research. Tabular data are included.

PB82-144858 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Area: Anaheim, Santa Ana, Garden Grove, Calif. Standard Metropolitan Statistical Area.
Aug 80, 471p HUD-0002102
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-02095-5.

This report presents statistics on housing and household characteristics in the Anaheim - Santa Ana - Garden Grove, Calif., Standard Metropolitan Statistical Area (SMSA). These statistics were derived from the 1977 - 78 Annual Housing Survey conducted in 20 selected SMSA's. The source of 1970 data shown in the report is tabulations from the 1970 Census of Population and Housing, and 1974 data were derived from the 1974 Annual Housing Survey. The report provides statistics on general housing characteristics for 1977, 1975, and 1970 and on indicators of housing and neighborhood quality for owner - occupied and renter - occupied housing units, on financial characteristics, on recent mover households, and on financial characteristics cross - classified by indicators of housing and neighborhod quality for 1977. Additionally, housing characteristics are given for black and Spanish heads of households. Statistics also illustrate the changes that have occurred in the housing stock of this SMSA from 1974 to 1977. For example, a net gain of 69,200 housing units has been recorded since 1974, with about 10 percent of the total housing stock constructed since the 1974 survey. Appendices describe the geographic area classifications and provide definitions and explanations of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of the data. Table finding guides and area maps are also included. (Author abstract modified).

PB82-144866 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Dallas, Tex., Standard Metropolitan Statistical Area.
Aug 80, 546p HUD-0002103
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-02097-1.

This report presents statistics on housing and household characteristics in the Dallas, Tex., Standard Metropolitan Statistical Area (SMSA). These statistics were derived from the 1977 - 1978 Annual Housing Survey conducted in 20 selected SMSA's. The source of 1970 data shown in the report is tabulations from the 1970 Census of Population and Housing, and 1974 data were derived from the 1974 Annual Housing Survey. The report provides statistics on general housing characteristics for 1977, 1974, and 1970 and on indicators of housing and neighborhood quality for owner - occupied and renter - occupied housing units, on financial characteristics, on recent mover households, and on financial characteristics cross - classified by indicators of housing and neighborhod quality for 1977. Additionally, housing characteristics are given for black and Spanish heads of households. Statistics also illustrate the changes that have occurred in the housing stock of this SMSA from 1974 to 1977. For example, a net gain of 42,200 housing units has been recorded since 1974, with about 6 percent of the total housing stock constructed since the 1974 survey. Appendices describe the geographic area classifications and provide definitions and explanations of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of the data. Table finding guides and area maps are also included. (Author abstract modified).

PB82-144874 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Fort Worth, Tex., Standard Metropolitan Statistical Area.
Sep 80, 508p HUD-0002104
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-02099-8.

This report presents statistics on housing and household characteristics in the Fort Worth, Tex., Standard Metropolitan Statistical Area (SMSA). These statistics were derived from the 1977 - 1978 Annual Housing Survey conducted in 20 selected SMSA's. The source of 1970 data shown in the report is tabulations from the 1970 Census of Population and Housing, and 1974 data were derived from the 1974 Annual Housing Survey. The report provides statistics on general housing characteristics for 1977, 1974, and 1970 and on indicators of housing and neighborhood quality for owner - occupied and renter - occupied housing units, on financial characteristics, on recent mover households, and on financial characteristics cross - classified by indicators of housing and neighborhod quality for 1977. Additionally, housing characteristics are given for black and Spanish heads of households. Statistics also illustrate the changes that have occurred in the housing stock of this SMSA from 1974 to 1977. For example, a net gain of 25,000 housing units has been recorded since 1974, with about 8 percent of the total housing stock constructed since the 1974 survey. Appendices describe the geographic area classifications and provide definitions and explanations of the subjects covered in the report, as well as information on sample design, estimation, and accuracy of the data. Table finding guides and area maps are also included. (Author abstract modified).

PB82-144882 MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1978. United States and Regions. Part A: General Housing Characteristics.
Nov 80, 291p HUD-0002105
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 003-024-02673-2.

This report presents statistics on general housing characteristics from the 1978 Annual Housing Survey for the United States. Data are presented for areas inside and outside the Standard Metropolitan Statistical Areas (SMSA's) and for each of the four geographic regions. The statistics are based on information from a sample of housing units. The information was collected by personal interviews from October 1978 to January 1979. The report provides data on general housing characteristics, indicators of housing and

neighborhood quality cross - classified by financial recent mover households, urban and rural housing characteristics, and energy - related housing characteristics. A large portion of the subjects covered in this report are the same as those collected in the 1970 Census of Housing; in general, these data are comparable to those shown in the 1970 Census reports. In addition, new subjects are introduced, including distance and travel time from home to work for the household head, storm windows and doors, insulation, breakdowns or failures in equipment, the physical condition of the structure, and the neighborhood conditions and services. Detailed statistics are also presented for mobile homes and trailers. Maps, a list of tables by regions, and a table - finding guide are included. Two appendices list area classifications and definitions and explanations of subject characteristics and of sources and reliability of the estimates. (Author abstract modified).

PB82-144890 PC **A15**/MF **A01**
Bureau of the Census, Washington, DC.
Annual Housing Survey: 1978. United States and Regions. Part C: Financial Characteristics of the Housing Inventory.
Aug 80, 326p HUD-0002106

This report presents statistics on financial characteristics of the housing inventory from the 1978 Annual Housing Survey for the United States by inside and outside standard metropolitan statistical areas (SMSA's) and each of the four geographic regions. Data are shown on income, value, and gross rent cross - tabulated by housing and household characteristics. Data were collected for approximately 78,000 sample housing units located in the counties and independent cities composing the 461 sample areas used in current surveys of the Census Bureau. Interviewers made personal visits to each sample unit and obtained the information from the occupants or if the unit was vacant, from other informed persons. The survey began in October 1978 and extended through January 1979. A series of standard tables present data showing characteristics for owner - occupied and renter - occupied housing units by income of the family or primary individual; characteristics for owner - occupied, 1 - unit structures by value of property; and characteristics for renter - occupied housing units by gross rent. The same information is also presented for housing units with black household heads and for housing units with household head of Spanish origin. In addition, Appendix A describes the geographic area classifications and Appendix B presents the information on sample design, estimation, and accuracy of the data. (Author abstract modified).

PB82-144908 PC **A99**/MF **A01**
RAND Corp., Santa Monica, CA.
Codebook for the Household Survey, Site I, Wave 3. Housing Assistance Supply Experiment,
Patricia Boren. Nov 79, 1009p RAND/N-1309-HUD, HUD-0002107
Contract HUD-H-1789

This codebook is one of a series documenting survey materials used in the Housing Assistance Supply Experiment (HASE), which monitors the effects of experimental housing allowance programs operating in two midwestern housing markets by regularly surveying a marketwide sample of about 2,000 residential properties. The owners and occupants of those properties are interviewed annually; the observable characteristics of residential buildings and their environs are recorded at less frequent intervals. The codebook describes the data collected in the third ("wave 3") household survey (officially called the survey of tenants and homeowners) conducted in Brown County, Wis., Site I of the experiment. The survey was administered from January through July 1976 by the National Opinion Research Center (NORC), the survey subcontractor. For each question in the survey instrument, the codebook reproduces the exact word text, specifies all permissible responses, and provides a tabulation of the unweighted responses recorded in the "preliminary master file" of survey records. Where applicable, individual questions are annotated with instructions to the survey staff that affect the interpretation of responses. Four appendices contain charts of Brown couunty neighborhoods, final status category codes, a glossary, and audit codes. (Author abstract modified).

PB82-144916 PC **A06**/MF **A01**
Urban Inst., Washington, DC.
Developer Supply, Investor Demand, and Multifamily Housing Production: A Pilot Study,
C. Duncan MacRae, Margery Austin Turner, and Gary Anderson. Jun 81, 124p HUD-0002109
Contract HUD-H-2162R

This report describes the implementation of a model that simulates the effects of the Federal income tax on the production of subsidized multifamily housing. The project consisted of data collection, computer programming, sensitivity analysis, and tax policy analysis. The report presents complete calibration, policy, and sensitivity results for a large survey of FHA - insured and State - housing - financed and development - agency - financed Section 8 projects from the Chicago region. The model processes data on actual Section 8 projects to derive (1) a distribution describing a universe of potential projects from which builder - developers select projects to produce and (2) a probability function describing builder - developers' willingness to undertake potential projects. The effects of policy alternatives on subsidized multifamily production were projected by first estimating the effect of a change on the distribution of potential projects and then applying the probability function to determine how many potential projects are actually produced. Results obtained for the 312 FHA - insured projects and 305 State housing finance agency projects indicate that the model does a reasonable job of explaining the observed distribution of projects undertaken. Simulation of three tax policy alternatives showed that substituting a straight - line depreciation schedule for the accelerated sum - of - the - years' - digits method reduces production by over three - quarters. The second alternative -- diminishing depreciation deductions by increasing the useful lives of all depreciable components -- caused subsidized multifamily housing production to decrease by about one - half. The third alternative, substituting a taxable cash subsidy of 14 percent of replacement cost for the tax benefits, left FHA - subsidized multifamily housing production relatively unaffected, while only a 12 - percent grant was necessary to maintain State housing finance agency production. Tabular data are provided. (Author abstract modified).

PB82-144932 PC **A03**/MF **A01**
RAND Corp., Santa Monica, CA.
Audit of the Survey of Residential Buildings, Site I, Wave 3. Housing Assistance Supply Experiment,
Sandra S. Figge. May 81, 41p RAND/N-1406-HUD, HUD-0002112
Contract HUD-H-1789

Results are reported from an assessment of the completeness of the data collected in the third (wave 3) survey of residential buildings in Site I (Brown County, Wis.) of the Housing Assistance Supply Experiment. The audit findings serve both to warn users of any significant defects in survey coverage and to check the effectiveness of field procedures. The audit involved verifying the composition of the wave 3 sample and determining whether an observation was completed for every sample building (and if not, why), along with examining the survey data for subtle errors not detectable in "cleaning checks." To avoid gathering data expected to be largely redundant, the wave 3 survey was addressed to a much smaller sample than in previous waves. The sample list contained 139 buildings -- 11 newly built on properties in the longitudinal sample, 69 in a sample of newly developed residential properties, and 59 in a sample of properties containing federally subsidized housing. Observations were completed for 107 buildings, 77 percent of the sample. Auditors subjected the survey data (already cleaned of clearly incorrect and implausible responses) to various checks for subtle errors. Each error report was investigated and the relevant response was confirmed without change, corrected, or replaced with a code explaining the absence of usable data. Footnotes, a glossary, and four tables are included. Supplementary tables are appended. (Author abstract modified).

PB82-144940 PC **A05**/MF **A01**
RAND Corp., Santa Monica, CA.
Audit of the Survey of Residential Buildings, Site I, Wave 2. Housing Assistance Supply Experiment,
Beverly F. Lowe. May 81, 94p RAND/N-1404-HUD, HUD-0002113
Contract HUD-H-1789

Results are reported from an assessment of the completeness and reliability of the data collected in the second (wave 2) survey of residential buildings in Site I (Brown County, Wis.) of the Housing Assistance Supply Experiment. The audit involved determining the wave 2 status of every building that was in the sample at baseline or was added later; assessing the quality of the survey data from the perspective of reliability, aptness, and completeness; and appraising the potential for bias due to survey nonresponse and devising weights for analytically adequate records so that they collectively represent the population of residential buildings in the county. In accounting for the sample, the discovery of sampling errors and property configuration changes necessitated the deletion of 15 buildings from the sample of 92 added to the survey schedule during the wave 2 field period, thus giving a total sample of 2,225 buildings, based upon the baseline sample. Fifty - two buildings were subsequently retired from the survey due to ineligibility. A sample completion rate of 93.3 percent was finally achieved. In checking on data quality, the audit validated 22 percent of all attempted observations by readministering a set of questions from the survey instrument. Because the validation results cast doubt on the general quality of the data, it was necessary to repeat all observations originally assigned to the observers whose work was most called in question. In the area of testing and compensating for bias, the strata and variables showing uncompensated biases are reported, leaving it to users to make adjustments appropriate to their analyses. Footnotes, a glossary, and 20 tables are given. Supplementary data are appended. (Author abstract modified).

PB82-145012 PC **A07**/MF **A01**
American Bar Association, Washington, DC. Special Committee on Housing and Urban Development Law.
Specialized Courts: Housing Justice in the United States. Executive Summary,
Randall W. Scott. Mar 81, 148p HUD-0002136
Contract HUD-H-2856
Sponsored in part by Fire Administration, Washington, DC.

This document summarizes a study of the nature and effectiveness of specialized courts established by several cities to deal with housing disputes, especially those involving landlord - tenant issues and code enforcement problems. The summary is intended to assist evaluations of local court systems as they relate both to code enforcement and to housing matters generally. Of paramount concern is the proper and fair administration of justice through local court systems in the handling of housing disputes. Thirteen cities were studied because they had installed such specialized courts. Analysis of these courts indicates that they may be able to improve the delivery of housing justice at the local level. Among the types of specialized courts examined were code courts, landlord and tenant courts, special small claims courts, quasi - comprehensive housing courts, and comprehensive housing courts. The report discusses the types of housing disputes that go to court, the existing weaknesses in most available forums for dispute resolution, and the features of specialized housing courts that may alleviate inequities. Organizational, staffing, and administrative aspects of the court system are discussed, with emphasis on caseloads management, judges and quasi - judicial officers, and operations of the clerk's office. Considerations involved in designing a housing court are discussed, including staffing requirements and the particular functions of the housing specialist's component, mechanisms for community participation, budgetary and cost implications, and location and physical facilities for the housing court. Procedural and substantive law problems encountered in the experience of existing specialized housing courts are delineated. Footnotes are provided and reference is made to eight publications of the American Bar Association's Special Committee on Housing and Urban Development Law.

PB82-145020 PC **A14**/MF **A01**
Abt Associates, Inc., Cambridge, MA.
Housing Allowance Demand Experiment: Final Report,
Stephen D. Kennedy. Jun 80, 317p AAI-80/61, HUD-0002137
Contract HUD-H-2040R

This report summarizes the results of the Housing Allowance Demand Experiment. Several programs were operated in Pittsburgh, Pa., and Phoenix, Ariz., from 1973 to 1976 involving about 2,400 experimental households and 1,000 control households. The two major types of allowance plans tested were the Housing Gap plans, which offered to pay eligible households the difference between the average local cost of

modest standard housing and some fraction of household income if they found housing that met program housing requirements, and the Percent of Rent plans, which paid some fraction of a household's rent. The experiment, which included an unconstrained income transfer program and a control group, collected information on other housing programs, including Public Housing, Section 23, and Section 236. The report describes the various housing goals used to evaluate the programs and presents evidence that the incidence of physically inadequate and overcrowded housing among low - income renters is far higher than current national data would indicate. A comparison of Housing Gap allowances with other housing programs shows that Housing Gap allowances can be used to provide comparable housing under at most the same and sometimes less economically and racially segregated conditions with at least equal and sometimes greater tenant satisfaction. In addition, the report discusses the effects of allowance programs on recipient housing and compares them to similar programs of unrestricted transfers. The final chapter reviews findings and areas for future research. Tables, figures, footnotes, and six references are supplied. A description of the Demand Experiment, an annotated bibliography, a supplemental reference list, and tabular data are appended. (Author abstract modified).

PB82-802505 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Tourism and Vacation Travel: State and Local Government Planning. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 202p
Supersedes PB80-813975, and NTIS/PS-79/0887.

Economic and socioeconomic aspects of vacation travel and tourism in various localities of the United States are documented. Most of these studies deal with the use of tourism for the economic development of local communities. Special attention is given to wilderness, coastal zone, lake, waterway, and Indian Reservation areas. Planning for scenic and historic areas is cited. (This updated bibliography contains 195 citations, 26 of which are new entries to the previous edition.)

PB82-802539 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Quality of Life in the Urban Environment. 1978-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1978-Nov 81.
Dec 81, 161p
Supersedes PB80-813256, and NTIS/PS-79/0881.

The attitudes of people toward cities and their development and circumstances of living in urban areas are reviewed. In addition to general studies, reports on specific topics; such as transportation, citizen involvement in neighborhood activities, housing, and social services are included. (This updated bibliography contains 153 citations, 34 of which are new entries to the previous edition.)

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-A107 101/8 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
An Analysis of the Isoenzymes of Creatine Phosphokinase and Lactic Dehydrogenase in the Esophagus,
Geoffrey M. Graeber, Michael J. Reardon, Arthur W. Fleming, Harold D. Head, and Rostik Zajtchuk. 1981, 9p
Pub. in The Annals of Thoracic Surgery, v32 n3 p230-234 Sep 81. Presented at the Annual Meeting of the Southern Thoracic Surgical Association (27th), 13-15 Nov 80, White Sulphur Springs, WV.

No abstract available.

DE81030486 PC **A03**/MF **A01**
Florida State Univ., Tallahassee.
Staphylococcus Aureus Protease: A Probe of Exposed, Non-Basic Histone Sequences in Nucleosomes.
R. L. Rill, and D. K. Oosterhof. 1980, 27p DOE/EV/05888-T2
Contract AS05-78EV05888

The digestion of histones in chicken erythrocyte nucleosome cores and chromatin by Staphylococcus aureus protease was examined. This protease cleaves specifically at acidic residues and prefers glu-X bonds under the conditions used. Only 1 of 24 glutamic and 2 of 13 aspartic acids among all four core histones are located in basic, amino-terminal tails, hence staph. protease is a highly specific probe of exposed nonbasic sequences. Staph. protease readily degraded H1, H5, and H3; moderately degraded H2b, and only slightly degraded H2a and H4 in nucleosomes and nucleosome cores. Electrophoresis of core histone fragments from limited digests showed that most glutamic acids were inaccessible, but at least five sites in nonbasic sequences were readily cleaved. Tentative assignments of these fragments based on comparisons with products from limited digests of pure histones suggested that most accessible sites in nucleosome cores occur in H3. The most probable sites of H3 cutting are glutamic acids at positions 51, 60, 73, 94, and 97. At least one site in H2b, probably the equivalent of glu-105 in the calf H2b sequence, was accessible. No sites in H2a and H4 appeared highly accessible. H5 was readily cleaved at a site near the amino-terminus. These data substantiate the other evidence that nonbasic core histone sequences are located primarily in the nucleosome interior, but that H3 binds to the ends of core DNA and thereby is partly exposed as the upper and lower surfaces of the disk-shaped core. (ERA citation 06:035478)

DE82000396 PC **A02**/MF **A01**
Massachusetts General Hospital, Boston.
Regulation of Nucleic Acid and Protein Synthesis: A Background Study Related to the Biological Effects of Radiation. Final Report on Research Activities.
1979, 5p DOE/EV/02403-T1
Contract AS02-76EV02403

The existence of an intricate interplay of nucleic acids and nucleotides in the chain of events leading from free amino acid to completed polypeptide chain has been determined. To this was added another participant to the nucleotides in protein synthesis - diadenosine-5', 5''', p'p exp 4 -tetraphosphate (Ap4A). Ap sub 4 A serves as an initiation primer for DNA synthesis in a eukaryotic system catalyzed by DNA polymerase alpha . Thus the initial step in protein synthesis is linked to the first step in DNA synthesis by a small molecular weight, unique dinucleotide signal. Advances in the methodology of nucleic acid sequencing have made it possible to examine the relationship between specific short segments of DNA and RNA and their function in the metabolism of the living cell. The triester method of synthesizing deoxynucleotide polymers has made it feasible to synthesize and use specific oligomeric deoxynucleotide sequences as probes of genetic function and potential viral inhibitors. The synthesis of ribonucleotide polymers has been more difficult, due almost entirely to the presence of the 2' ribosyl hydroxyl group. The possibility is now emerging, however, of employing ribonucleotide polymers as specific RNA-virus inhibitors. (ERA citation 06:035477)

PB81-929905 Not available NTIS
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Selected Aspects of Cancer-Related Proteins, Carbohydrate, Lipid, and Other Biochemistry.
Special listing.
Nov 81, 124p NCI/ICRDB/SL-455
Supersedes PB80-929902.

This Special Listing of Current Cancer Research Projects is a publication of the International Cancer Research Data Bank (ICRDB) Program of the National Cancer Institute. Each Listing contains descriptions of ongoing projects in one selected cancer research area. Approximately 55 areas are covered in separate Special Listings. The research areas include: Biochemistry of cell surface proteins; Biochemistry of cytoplasmic and extracellular proteins; Studies on protein synthesis, modification, and turnover related to cancer biology; Biochemistry of amino acids and polyamines; Carbohydrate metabolism in normal and neoplastic cells; Studies on the biochemistry of lipids of normal and neoplastic cells; Biochemical and biophysical studies of the cell membrane and transport mechanisms; Studies on the metabolism of calcium and other elements in normal and neoplastic cells; Vitamins and other topics in cancer-related biochemistry.

6C. Biology

AD-A106 954/1 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Culicidae,
Ronald A. Ward. 1981, 13p
Pub. in Aquatic Biota of Tropical South America, Pt 1 p245-256 1981. Text in Spanish and English.

No abstract available.

AD-A107 336/0 PC **A02**/MF **A01**
Office of Naval Research, London (England).
Biophysics of Water: A Working Conference.
Conference rept.,
P. T. Beall. 15 Sep 81, 21p Rept no. ONRL-C-9-81

A working conference on the biophysics of water was held at the University of Cambridge, England, on June 29 - July 3, 1981. The conference highlighted four major areas of research: Molecular Hydration and Biological Function, Surface Forces in Biological Systems, Water as an Agent of Homeostasis in Organisms, and Physiological Water Stress. This report contains discussions and observations on presentation that were of special interest to the author. It also contains recommendations about future areas of research. (Author)

DE81030165 PC **A02**/MF **A01**
Purdue Univ., Lafayette, IN. Dept. of Botany and Plant Pathology.
Seed-Protein Genes and the Regulation of Their Expression. Progress Report.
B. A. Larkins, T. K. Hodges, D. E. Foard, and M. L. Tomes. Aug 81, 8p DOE/ER/10715-T1
Contract AC02-80ER10715

Research during the past year focused on two aspects of seed protein research. One objective explored the possibility of using Xenopus laevis oocytes as a potential system for studying expression of cloned storage protein genes. A second objective developed methods for isolating and partially purifying mRNAs directing the synthesis of the low molecular weight protease inhibitors of soybean seeds. (ERA citation 06:035486)

DE81030735 PC **A02**/MF **A01**
Associated Universities, Inc., Washington, DC.
Heterogeneity and Expression of the Zein Storage Protein Gene Family of Maize.
F. Burr, and B. Burr. 1981, 13p BNL-30027, BIO-3764, CONF--8104110--1
Contract AC02-76CH00016
Stadler genetics symposium, Columbia, MO, USA, 10 Apr 1981.

The storage protein zein is synthesized by polysomes on the endoplasmic reticulum in certain cells of the maize seed. As zein accumulates within the membrane lumen the cisternae are transformed into vesiculate protein bodies. Zein is comprised of a large family of structurally related polypeptides that fall into two classes of 19,000 and 22,500 daltons. On two dimensional IEF:SDS polyacrylamide gels, the number and positions of the electromorphs within each class differ greatly from one strain to another. Typically, however, there may be 8 to 12 spots for each class. Within any strain that has been examined the polypeptides consti-

tuting each molecular weight class have a similar amino-terminal sequence, but there are a number of position differences when the sequences are compared between strains. An in vitro system using maize endosperm membranes has been developed to study the synthesis and processing of maize preproteins. Assessment of the products made indicates that the method faithfully recapitulates the in vivo processes. Cloned cDNA zein sequences were employed to examine the extent of genetic heterogeneity. Based on restriction analyses and dot hydridizations, eighteen zein clones could be divided into three classes for the light zein class and two for the heavy zein class. The Southern transfer hydridizations showed a very complex picture that suggests that zein is encoded by many genomic sequences which share partial homologies. Many more sequences are recognized than there are polypeptides. Possibly some of these represent relic sequences and pseudogenes but until more is known about the structures of the different zein genes, an estimate of the number of copies in the maize genome by hydridization with cloned sequences cannot be made. (ERA citation 06:035485)

DE82000153 PC **A02**/MF **A01**
Florida State Univ., Tallahassee. Inst. of Molecular Biophysics.
Impact of Energy-Related Pollutants on Chromosome Structure. Progress Report, January 1, 1981-December 31, 1981.
R. L. Rill. 1981, 11p DOE/EV/05888-4
Contract AS05-78EV05888

Products of reactions of deoxyribonucleosides with diethylsulfate and ethyl methanesulfonate in neutral aqueous solution and in DMSO, and with ethyl iodide in DMSO, were separated and quantitated by reverse phase PHLC. Aqueous reactions yielded small, but significant, amounts of nucleosides modified at exocyclic positions. Several unidentified derivatives not previously reported were found. A method for resolving all known ethylated deoxyribonucleotides was developed. The covalent coupling of ethidium monoazide to DNA alone and DNA in chromatin was examined. Covalently bound ethidium preferentially bound to DNA recovered in subnucleosomes. The amount of covalently bound ethidium recovered in mononucleosomes decreased with increasing nuclease digestion, suggesting that nucleosomes most susceptible to nuclease attack preferentially bind ethidium. Covalently bound ethidium weakens the glycosidic bond so that the DNA chain can be cleaved specifically at ethidium-bound sites. This will permit precise definition of ethidium binding sites in nucleosomes. High field, natural abundance carbon-13 NMR spectra and NOE data were obtained for nucleosome core length DNA complexed with various concentrations of mercury. Mercury binding caused no significant changes in resonance linewidths or NOE's. This suggests that mercury ions primarily form interstrand crosslinks between base pairs without affecting the chain motional dynamics. (ERA citation 06:035518)

N82-11758/1 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Laser Induced Fluoroescence from Algae: Results of a Ship-Borne Field Test.
B. Hartmann, O. Steinvall, and A. Widen. Sep 81, 44p NASA-TM-76626, FOA-C-30171-EL
Contract NASW-3541
Transl. Into English of "Laserinducerad Fluorescens from Alger: Resultat Fraan Ett Baatburet Faeltfoersoek" Rept. Foa-C-30171-El, Stockholm, Jul. 1979 p 1-51. Transl. By Kanner (Leo) Associates, Redwood City, Calif. Original DOC. Prep. By National Defense.

A basis is provided for the feasibility of air-borne laser fluorosensing not only of chlorophyll but also of pollutants such as oils and chemicals. There was a satisfactory correlation between the laser data and those obtained manually. The absolute determination of the chlorophyll concentration is discussed.

PB82-109406 PC **A04**/MF **A01**
National Marine Fisheries Service, Panama City, FL. Panama City Lab.
Size and Sex Ratio of King Mackerel, 'Scomberomorus cavalla', in the Southeastern United States.
Technical memo.,
Lee Trent, Roy O. Williams, Ronald G. Taylor, Carl H. Salmon, and Charles S. Manooch, III. Apr 81, 63p NMFS-SEFC-62, NOAA-81073102

Data from over 54,000 king mackerel, Scomberomorus cavalla, were analyzed to evaluate temporal variations in size and sex composition in seven areas of the southeastern United States. Data were obtained from recreational hook-and-line fishermen of the coastal states from Texas to North Carolina, and from commercial hook-and-line and gill-net fishermen of south Florida. Most of the length-frequency distributions derived from king mackerel catches were unimodal. This distribution is typical of a species that spawns over a long period each year, has highly variable growth rates among individuals, or both. Size composition in each area varied considerably between months and indicated temporally heterogeneous groups of king mackerel. Females were dominant in the catches in all areas and years except south Florida in 1978. Annual or ranges of annual estimates of percentage female by area were: Texas, 60.8 to 62.2%; Louisiana 91.9 to 92.2%; northwest Florida, 57.1 to 75.1%; south Florida, 40.2 to 75.4%; and North Carolina, 75.8%. No explanation for these deviations from a 1:1 sex ratio was attempted. District seasonal changes in sex ratio were observed only in Texas.

PB82-132457 PC **A02**/MF **A01**
Cincinnati Univ., OH.
Report of an Amphipod Species New to Ohio: 'Gammarus minus' Say (Amphipoda: Gammaridae).
Journal article,
David C. Beckett, Philip A. Lewis, and John R. Holsinger. 24 Mar 77, 4p EPA-600/J-77-183
Pub. in Ohio Jnl. of Science 77(4), p242 Sep 77. Prepared in cooperation with Old Dominion Univ., Norfolk, VA.

Gammarus minus is reported from two locations in Southern Ohio. This is the first record of the species from Ohio, although it is very common from other limestone areas of the midwest.

PB82-132465 PC **A02**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Entomology.
A New Species of 'Stenonema' (Ephemeroptera: Heptageniidae) from Eastern North America.
Journal article,
Frank Louis Carle, and Philip A. Lewis. 16 Aug 77, 6p EPA-600/J-78-189
Pub. in Annals of the Entomological Society of America, v71 n3 p285-288, 15 May 78.

Adults and nymphs of Stenonema meririvulanum sp. are described. Adults are characterized by large dark spiracular dots, gray margined hind wings, and very long banded caudal filaments. Nymphs are characterized by 'V'-shaped pale areas on abdominal terga 7-9, posterolateral spines on abdominal segments 7-9, and an unmarked abdominal venter. The species has been collected from small prisine streams in the Appalachian Mountains.

PB82-135963 PC **A04**/MF **A01**
Environmental Resources Management, Inc., West Chester, PA.
Susquehanna River Anadromous Fish Studies, Conowingo Dam to Havre De Grace, Maryland.
Final rept.,
Harold J. Petrimoulx, Peter N. Klose, C. Braxton Dew, and George T. Potera. Dec 80, 67p PPSP/UBLS-80-5
See also PB82-135971. Prepared in cooperation with Lawler, Matusky, and Skelly Engineer, Inc., Pearl River, New York.

The abundance and life history of the four Alosa spp. spawning in the lower Susquehanna River, Maryland, were studied during the Spring of 1980. The present study was initiated to provide additional information needed to assess quantitatively the status of the anadromous fishery and to investigate possible effects of the discharge schedule of the Conowingo Dam on Alosa spp. migration patterns in the lower river.

PB82-136300 PC **A02**/MF **A01**
Fish and Wildlife Service, Lamar, PA. Lamar Fish Cultural Development Center.
Culturing, Harvesting, and Grading 'Daphnia',
R. G. Howey, and P. B. Haines. Sep 80, 16p LAMAR INFORMATION LEAFLET-80-04

Daphnia were intensively cultured in small, concrete ponds at Lamar, Pennsylvania to be used as live food for walleye and American shad fry. The culture, collecting, and grading systems and techniques are described in the report.

PB82-136391 PC **A02**/MF **A01**
Fish and Wildlife Service, Lamar, PA. Lamar Fish Cultural Development Center.
Intensive Culture of Walleye ('Stizostedion vitreum vitreum'),
R. G. Howey, G. L. Theis, and P. B. Haines. Sep 80, 15p LAMAR INFORMATION LEAFLET-80-05

An intensive rearing program was initiated at Lamar Fish Cultural Development Center in an attempt to eliminate some of the unreliability in the pond culture of walleye. Miniaturized salmonid-type indoor facilities were used to rear the fish. The fry were started on Artemia and subsequently converted to a formulated dry diet at 1.5 cm with just under 30% survival. At present, a larger live-food organism, such as Daphnia, appears to be an intermediate requirement by the walleye before they can be converted to the formulated dry diet.

PB82-136425 PC **A02**/MF **A01**
Fish and Wildlife Service, Lamar, PA. Lamar Fish Cultural Development Center.
The Use of Self-Feeders in Fish Culture,
Ivan B. McElwain. Sep 80, 13p LAMAR INFORMATION LEAFLET-81-01

The use of self-feeders is becoming popular at fish hatcheries throughout the country. They can be used with many different species of fish as well as with fish of different ages and sizes. Advantages result in better quality fish along with money and labor savings. Disadvantages are few and can be minimized at the hatchery.

PB82-136615 PC **A02**/MF **A01**
Fish and Wildlife Service, Lamar, PA. Lamar Fish Cultural Development Center.
Handling and Transporting Juvenile American Shad,
R. G. Howey, and G. L. Theis. Sep 80, 15p LAMAR INFORMATION LEAFLET-80-02

Specialized techniques and equipment are necessary for loading, transporting, and unloading juvenile American shad due to their extreme sensitivity. A handling device, is described in the report to eliminate netting or bucketing the shad and to minimize stress during hauling. A pipe discharge system was tested and found to be suitable as a non-injurious method of unloading the juvenile shad. Addition of common table salt (0.25%) to the water reduced mortality rates during transport.

PB82-136623 PC **A02**/MF **A01**
Fish and Wildlife Service, Lamar, PA. Lamar Fish Cultural Development Center.
Degassing Supersaturated Water for Fish Culture,
R. G. Howey, and G. L. Theis. Sep 80, 14p LAMAR INFORMATION LEAFLET-81-02

A vacuum degasser was designed, constructed, and tested at Lamar Fish Cultural Development Center to alleviate problems caused by nitrogen supersaturation of heated water used in fish culture. A vacuum degassing system appears to be effective in eliminating the gas supersaturation problem.

PB82-136631 PC **A02**/MF **A01**
Fish and Wildlife Service, Lamar, PA. Lamar Fish Cultural Development Center.
Decapsulation of Brine Shrimp ('Artemia salina') Cysts,
P. B. Haines, R. G. Howey, and G. L. Theis. Sep 80, 12p LAMAR INFORMATION LEAFLET-80-06

The outer shell of brine shrimp (Artemia salina) cysts can be removed by chemical treatment, resulting in improved digestibility of the hatched product when fed to larval fish.

PB82-136649 PC **A02**/MF **A01**
Fish and Wildlife Service, Lamar, PA. Lamar Fish Cultural Development Center.
Controlled Large-Scale Hatching of Brine Shrimp, 'Artemia salina',
J. W. Meade, P. B. Haines, R. G. Howey, and G. L. Theis. Sep 80, 14p LAMAR INFORMATION LEAFLET-80-03

Brine shrimp (Artemia salina) nauplii can be cultured in large quantities for feeding larval fish by incubating Artemia cysts in containers in a simple, easily-constructed incubation cabinet.

PB82-136656 PC **A02**/MF **A01**
Fish and Wildlife Service, Lamar, PA. Lamar Fish Cultural Development Center.
Electronically-Controlled Automatic Live-Food Feeder,
G. L. Theis, and R. G. Howey. Sep 80, 12p LAMAR INFORMATION LEAFLET-80-01

An automatic unit for feeding small, live organisms is described in the report. Feeding periods, intervals, and amounts fed are controlled by an electronic timing system.

PB82-137886 PC **A05**/MF **A01**
Martin Marietta Corp., Baltimore, MD. Environmental Center.
Investigation of Hydrodynamic and Behavioral Factors That Affect Zooplankton Sampling by Pumps.
Final rept.,
Fred Jacobs, Al Y. Kuo, and George C. Grant. Oct 81, 78p PPSP-MP-34
Prepared in cooperation with Virginia Inst. of Marine Science, Gloucester Point.

The present study used a recirculating hydraulic flume to examine the effects of ambient flow regimes, flow fields induced by sampling pumps, sampler orientation, and copepod behavior. The study evaluates the degree to which these factors and their interactions influence the accuracy of zooplankton density estimates. The methodology included a descriptive phase, which is a presentation of flow visualizations under a variety of ambient and pumping conditions. This was followed by quantitative experiments that tested the ability of pump samplers to obtain accurate density estimates of passive particles. Results of this study provide a greater understanding of problems associated with zooplankton sampling in power plant cooling systems and in natural waters.

PB82-139817 PC **A22**/MF **A01**
Combs (Earl R.), Inc., Mercer Island, WA.
Alaska OCS Socioeconomic Studies Program: St. George Basin and North Aleutian Shelf Commercial Fishing Industry Analysis.
Final rept.,
Jeffrey Tobolski, Lemuel Guluka, Dan Trefethen, and Kwang Im. Oct 81, 513p TR-60, BLM/YK-TR-81/01
Contract DI-AA851-CT0-34
See also PB82-139825.

This report consists of an update of the data base and analysis of the potential impacts to commercial fishing of proposed Outer Continental Shelf oil and gas lease sales in the St. George Basin and North Aleutian Shelf, situated in the Bering Sea off Alaska. Impacts on the Bristol Bay fishery are also discussed. Competition for labor between the fishing and oil industries is examined, as well as an analysis of risk of collision among vessels in the OCS areas. A description of the fisheries resources of the area is followed by an analysis of loss of access to fishing grounds, and loss of or damage to gear. Impacts on the recreational fishery are also discussed.

PB82-859703 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Red Tide: Taxonomy and Life Cycle. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for Jan 78-Dec 81.
Dec 81, 114p

This bibliography contains citations concerning the toxonomy and life cycle of the dinoflagellates responsible for the red tide. Enviromental conditions favorable for their growth, seasonal variations in blooms, isolation of the toxins, and chemical and bioassay methodologies are considered. Specific red tide occurances are discussed. (Contains 91 citations fully indexed and including a title list.)

6D. Bionics

AD-A107 219/8 PC **A02**/MF **A01**
SRI International, Menlo Park, CA.
Multiple-Agent Planning Systems,
Kurt Konolige, and Nils J. Nilsson. 1980, 4p
Contract N00014-80-C-0296
Pub. in Machine Intelligence, n10 p138-141 Dec 80.

No abstract available.

6E. Clinical Medicine

AD-A106 825/3 PC **A03**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Feline Malignant Lymphoma: A Multiway Frequency Analysis of a Population Involving Sex, Age, Cell Type, and Tumor Location.
Master's thesis,
Michael V. Slayter. Jul 79, 31p Rept no. AFIT-CI-79-300T-S

A multidimensional descriptive study of feline malignant lymphoma was performed using age, sex, cell type, and tumor location of 1,733 cases. The interactions between these four variables were determined and interpreted. Particular consideration was given to the relationships of age to tumor location, age to sex, and tumor location to cell type. These three interactions were shown to be the major interactions in the study. The use of computer analysis of the multiway frequency table was discussed. Suggestions were offered that future lymphoma studies utilize the multiway frequency table with different variables. (Author)

AD-A106 827/9 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Health and Safety Deficiencies Found at Water Recreation Areas.
15 Jun 81, 35p Rept no. GAO/CED-81-88
Report to the Chairman Committee on Appropriations, United States Senate.

This report discusses the health and safety conditions of nonfederally managed water recreation areas at the Corps of Engineers' and the Water and Power Resources Service's reservoirs. This report shows that there are deficiencies in drinking water and sanitation systems and unsafe structures at some of these areas. Additional funds and authority may be necessary to correct these deficiencies.

AD-A106 853/5 PC **A02**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
The Health Opinion Survey: Predicting Illness in Military Trainees,
James E. McCarroll, Dennis M. Kowal, and Pamela W. Phair. 1979, 9p Rept no. USARIEM-M-9/79
Pub. in Military Medicine, v146 n7 p463-468 Jul 81. Supersedes AD-A073 234.

No abstract available.

AD-A106 876/6 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Medicare's Reimbursement Policies for Durable Medical Equipment Should be Modified and Made More Consistent.
10 Sep 81, 42p Rept no. GAO/HRD-81-140
Report to the Honorable Russell B. Long, United States Senate.

This review was requested by the former Chairman of the Subcommittee on Health, Senate Committee on Finance, to evaluate allegations to the effect that suppliers of durable medical equipment to Medicare beneficiaries in certain southeastern States were being subjected to discriminatory reimbursement and coverage requirements. Medicare payments for durable medical equipment--hospital beds, wheelchairs, commodes, and oxygen equipment--are estimated in excess of $125 million a year. Durable medical equipment for use in a beneficiary's home is covered under Medicare if it is medically necessary. Medicare payments for such items are made by contract paying agents called carriers. For two items of equipment (standard hospital beds and wheelchairs), the payments may not exceed an amount based on the lowest charge level at which the items are 'widely and consistently available in a locality.' The Health Care Financing Administration (HCFA) has defined the lowest charge level as one high enough to include the cumulative 25th percentile in the distribution of actual charges submitted during a previous period. GAO was asked to review the payment levels for durable medical equipment in Georgia, Alabama, Florida, South Carolina, and selected other States. The other States were Connecticut, New Hampshire, Vermont, Missouri, and northern California. (Author)

AD-A106 945/9 PC **A05**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Fathering and the Pediatric Cancer Experience.
Master's thesis,
Patricia Ann Damler. Dec 79, 93p Rept no. AFIT-CI-79-308T

A descriptive study was conducted to answer the question: What is the cultural knowledge that informs the behavior of fathers in interaction with their children during the pediatric cancer experience. The concepts of the culture of the father, the fathers' role in the family, and the crisis of the pediatric cancer experience formed the basis of the conceptual framework. Ethnographic interviews were conducted with four fathers of children being treated at a medical center in a large southwestern city. Tape recordings of the interviews were transcribed and analyzed between interviews. From analysis of the recordings, taxonomies were developed of which 'kinds of things fathers do with children' and 'kinds of things fathers do when they monitor the health of children' are examples. Five cultural themes identified: (1) being there, (2) education on a day to day basis, (3) recreation, (4) fear, and (5) quality of life. Fathers were found to be deeply involved and therefore their views need to be emphasized in the nursing care of children. (Author)

AD-A106 952/5 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Trypanosoma congolense: Natural and Acquired Resistance in the Bovine,
Bruce T. Wellde, Wayne T. Hockmeyer, Robert M. Kovatch, Manmohan S. Bhogal, and Carter L. Diggs. 22 Aug 80, 16p
Pub. in Experimental Parasitology, v52 p219-232 1981.

No abstract available.

AD-A106 955/8 PC **A02**/MF **A01**
Army Medical Research Unit, Kuala Lumpur (Malaysia).
Scrub Typhus Antibody in Cynomolgus Monkeys (Macaca fascicularis) in Malaysia,
Gregory B. Heisey, Elsie Gan, Akira Shirai, and Michael G. Groves. 1981, 5p
Pub. in Laboratory Animal Science, v31 n3 p289-291 Jun 81.

No abstract available.

AD-A106 956/6 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
In vivo and in vitro Localization of Leishmania within Macrophage Phagolysosomes: Use of Colloidal Gold as a Lysosomal Label,
Jonathan D. Berman, Thomas B. Fioretti, and Dennis M. Dwyer. 23 Jun 80, 5p
Pub. in Jnl. of Protozoology, v28 n2 p239-242 1981.

No abstract available.

AD-A106 957/4 PC **A02**/MF **A01**
Army Medical Research Unit, Kuala Lumpur (Malaysia).
Rickettsia tsutsugamushi Antibody in Mother/Cord Pairs of Sera,
Akira Shirai, Grahaem W. Brown, Elsie Gan, David L. Huxsoll, and Michael G. Groves. 29 Sep 80, 5p
Pub. in Japanese Jnl. of Medical Science and Biology, v34 n1 p37-39 Feb 81.

No abstract available.

AD-A106 959/0 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Verdict on Vagotomy,
John W. Harmon, and Paul H. Jordan, Jr. 1981, 4p
Pub. in Gastroenterology, v81 p809-813 1981.

No abstract available.

AD-A106 960/8 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.

Inhibition of in vitro Growth of Plasmodium falciparum by Immune Serum from Monkeys,
Jeffrey D. Chulay, J. David Haynes, and Carter L. Diggs. 26 Jan 81, 11p Rept no. CONTRIB-1599
Pub. in Jnl. of Infectious Diseases, v144 n3 p270-278 Sep 81.

No abstract available.

AD-A106 961/6 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Trypanosoma rhodesiense: Chemical and Immunological Characterization of Variant-Specific Surface Coat Glycoproteins,
John G. Olenick, Richard W. Travis, and Seymour Garson. 16 Dec 80, 14p
Pub. in Molecular and Biochemical Parasitology, v3 p227-238 1981.

No abstract available.

AD-A107 008/5 PC **A02**/MF **A01**
Instituto Evandro Chagas, Belem (Brazil).
A Multidisciplinary Program of Infectious Disease Surveillance along the Transamazon Highway in Brazil: Epidemiology of Arbovirus Infections,
Kenneth E. Dixon, Craig H. Llewellyn, A. P. A. Travassos da Rosa, and J. F. Travassos da Rosa. 1981, 17p
Grant DAMD17-74-G-9378
Pub. in Bulletin of the Pan American Health Organization, v15 n1 p11-25 1981.

No abstract available.

AD-A107 036/6 PC **A02**/MF **A01**
Army Inst. of Dental Research, Washington, DC.
Evaluation of the Parietal Bones in the Rat as a Specific Site for the Testing of Osteogenic Materials. A Simple Animal Model to Study Bone Implant Material.
Rept. for Aug-Oct 81,
Jeffrey O. Hollinger, and Sonia A. Gee. Oct 81, 14p

A full-thickness periosteal scalp flap overlying the parietal bones of rats was made and a trephine was used to prepare a 2.5 mm diameter osseous defects to the pia mater. Healing was evaluated by gross and histologic examination at two-week intervals for eight weeks using a Zeiss Videoplan Image Analysis System with Osteoplan. None of the osseous defects healed by bony union. (Author)

AD-A107 093/7 PC **A16**/MF **A01**
Army Inst. of Surgical Research, Fort Sam Houston, TX.
US Army Institute of Surgical Research Annual Research Progress Report, FY 1980.
Rept. for 1 Oct 79-30 Sep 80,
Basil A. Pruitt, Jr. 1 Oct 80, 355p

This report documents the clinical and laboratory activities of the US Army Institute of Surgical Research during the fiscal year 1980. These activities include patient care, clinical investigation, and laboratory research in the areas of burn injury and general trauma. Special emphasis is placed on the clinical management of burned patients and on studies related to prevention and treatment of burned wound infection. (Author)

AD-A107 194/3 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
The National Institute on Alcohol Abuse and Alcoholism Should Make Greater Efforts to Support Treatment Demonstration Projects.
31 Jul 81, 16p Rept no. GAO/HRD-81-131

We have reviewed selected activities of the Department of Health and Human Services' (HHS') National Institute on Alcohol Abuse and Alcoholism (NIAAA) pertaining to the treatment and rehabilitation of alcohol abusers and alcoholics. Our review was undertaken to assess the management and effectiveness of NIAAA's directly funded treatment grant program. We are making this report because our observations pertaining to HHS' involvement in treatment demonstration projects are relevant to S.755, which was introduced on March 23, 1981, to reauthorize NIAAA and refocus its activities on technical assistance, research, and demonstration efforts.

AD-A107 200/8 PC **A12**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
The Effects of Diet Calcium, Protein and Acidity on Calcium Retention in the Rat, Particularly as Related to the Inner and Outer Surfaces of Tubular Bone: A Possible Model for the Treatment or Prevention of Osteoporosis.
Doctoral thesis,
Joseph E. Milligan. Oct 79, 267p Rept no. AFIT-CI-79-304D-S

The effects of graded levels of diet calcium, protein and acidity on radiographic and gravimetric measurements, and on mineral composition of femurs were studied in Long Evans, young and old, female rats. With increased diet calcium, femur potassium percent in ash is decreased in both young and old rats. Otherwise, bone (as a tissue) is chemically unaffected by diet treatment. Increasing diet protein results in increased bone turnover at both bone surfaces, as well as increased cortical area and bone density in young rats. The effects of graded levels of diet calcium, protein and acidity on soft tissue calcification were also studied in female rats fed diets with varying magnesium levels which met National Research Council Requirements but which induced elevated kidney calcium levels as reported by some reseachers. Low magnesium diets in the young growing rat induced nephrocalcinosis which was shown by histopathologic examination to be an intracellular-initated dystrophic calcification.

AD-A107 206/5 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Myeloproliferative Disorder with Unusual Marrow Chromosome Constitution,
J. M. Whaun, C. C. Lin, B. Biederman, S. J. Cornish, and J. B. Dundas. 26 Aug 80, 7p
Pub. in CANCER, v48 n5 p1164-1169, 1 Sep 81.

No abstract available.

AD-A107 258/6 PC **A08**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Long and Short-Term Memory Processes in Cortically Damaged Patients.
Doctoral thesis,
Jordan Grafman. 1981, 173p Rept no. AFIT-CI-81-54D

The purpose of this study was to examine the contribution of the cerebral (non-limbic) cortex to specific verbal memory processes. Based on a literature review of psycholinguistic and memory processes in normals and central nervous system impaired patients, a tentative model of the brain regions subserving verbal memory processes was developed by the author. The model suggests that the left hemispheric cortex subserves both short term memory and lexical/conceptual storage, while the encoding or 'tagging' process that results in verbal information being transformed from a short term to long term state is dependent upon subcortical (limbic-thalamic) systems. To test the validity of this model, several hypotheses were developed. It was suggested that left cortically lesioned patients would have an inferior performance to controls and right cortically lesioned patients on recall, retrieval from long term storage, and long term storage measures on early trials of a Selective Reminding Test primarily due to a phonemic processing impairment. It was also suggested that only cortically lesioned patients (but not controls) would have poorer recall for low frequency relative to high frequency words. The results suggested that the left cortically lesioned group had a limited auditory-verbal memory deficit due to both linguistic (phonemic processing) and memorial (long term retrieval) factors. Their performance, however, was both qualitatively and quantitatively superior to Korsakoff patients who demonstrated severely impaired encoding and retrieval processes as a probable result of minimal contextual or episodic tagging of verbal stimuli.

AD-A107 271/9 PC **A02**/MF **A01**
Army Inst. of Dental Research, Washington, DC.
Dental Emergencies Occurring among U.S. Army Recruits.
Rept. for Jan-Jun 80,
Pushpinder S. Grover, William M. Carpenter, and Gary W. Allen. 30 Sep 81, 10p

A study was undertaken to determine the incidence of dental emergencies among 5,000 U.S. Army recruits during basic field training. A total of 1,294 recruits reported for dental sick call over a period of 6 months. The most frequently occurring conditions causing emergency vists were found to be caries, periapical abscesses, postoperative complications, pericoronitis, defective restorations, gingivitis, traumatic injuries, and mucosal ulcers. (Author)

AD-A107 272/7 PC **A02**/MF **A01**
Army Inst. of Dental Research, Washington, DC.
Predictability of Dental Emergencies by Panography.
Rept. for Jan-Jun 80,
Pushpinder S. Grover, William M. Carpenter, and Gary W. Allen. 30 Sep 81, 14p

A study was undertaken to evaluate the effectiveness and reliability of panoramic radiography for prediction of dental emergencies. Five thousand panographs were reviewed, and 732 potential dental emergency situations (PDES) were identified. Over a 6-month period, 248 of the recruits identified as PDES actually reported for dental sick call. This constituted 19 percent of the total sick call. It is believed that by proper interpretation of panographs and by making provisions for interceptive dental care, at least 19 percent of the total sick call could be eliminated. (Author)

AD-A107 290/9 PC **A03**/MF **A01**
Academy of Health Sciences (Army), Fort Sam Houston, TX. Health Care Studies Div.
An Assessment of the Dental Needs of Army Recruits.
Final rept.,
Warren A. Parker, David G. Brunner, and A. David Mangelsdorff. Jul 81, 41p Rept no. HCSD-81-004

Current information about the dental care needs of Regular Army recruits is not routinely available to the Department of the Army Assistant Surgeon General for Dental Services for use in determining the allocation of limited dental resources. Similar information about the Reserve and National Guard components is also sorely lacking to mobilization planners. The purpose of this study was to determine the dental treatment needs of Army recruits by component, sex, ethnic background, and level of education. A random selection of incoming recruits was examined by experienced dental officers, and treatment plans were developed. The resulting data was analyzed to determine the needs per thousand recruits for 15 care variables. Treatment times were also established to provide the required care. In general the dental care needs of current all-volunteer forces are approximately the same as when the draft was in effect although shifts have occurred in the relative magnitude among the care variables. Restorations account for 41% of total care needs of recruits. Significant differences were shown among the needs for Army components. Level of education and ethnic background are important variables in determining recruit population dental needs. It is recommended that the report be made available to dental resource utilization and mobilization planners and that a dental classification system that identifies severity of care needed be developed and implemented.

AD-A107 302/2 PC **A02**/MF **A01**
Office of Naval Research, London (England).
International Symposium on Nuclear Techniques in the Study and Control of Parasitic Diseases of Man and Animals.
Conference rept.,
Michael Stek, Jr. 1 Sep 81, 6p Rept no. ONRL-C-7-81

This is a report of a meeting at which ideas were exchanged on the application of nuclear techniques and the use of radioisotopes in the research and development of serodiagnostic and seroepidemiological procedures, antiparasitic vaccines, and chemotherapeutic agents. Techniques which the author judged to have special significance are discussed. (Author)

AD-A107 431/9 PC **A03**/MF **A01**
Academy of Health Sciences (Army), Fort Sam Houston, TX. Health Care Studies Div.
Teleradiology.
Final rept.,
James J. James, A. David Mangelsdorff, and Warren A. Parker. May 81, 39p Rept no. HCSD-81-003

Radiographic studies representative of the spectrum of trauma cases that might be present in an emergency room were selected from actual cases presented to the emergency room at Brooke Army Medical Center (BAMC) in San Antonio, Texas. The studies were then transmitted from a local television studio via satellite back to BAMC and three other Army Hospitals on two

separate occasions. The transmitted images were viewed on commercial grade television sets by panels of physicians (radiologists and other specialties) at the receiving hospitals. The panel members were asked to give their diagnostic impressions regarding the specific cases and to comment on the applicability and usefulness of teleradiology. Overall, it was found that an image of diagnostic quality could be transmitted for most, but not all radiographic cases and that the participating physicians felt this approach had great potential for the practice of radiology both in field and fixed AMEDD facilities.

AD-A107 440/0 PC **A03**/MF **A01**
Naval Postgraduate School, Monterey, CA.
An Information System for the Peruvian Air Force Hospital.
Master's thesis,
Juan Saona Nunez del Prado. Jun 81, 48p

The purpose of this project/thesis is to define the preliminary study of a hospital information system for the Peruvian Air Force Hospital. It is written with the intention of giving to the Peruvian Air Force staff, and also to the hospital manager, an idea of the meaning of a Hospital Information System. In addition, the project/thesis describes how it would work and which would be the best system to be implemented. The last part of this project/thesis describes some of the positive and negative effects and reaction for the personnel that will be involved in this system. (Author)

AD-A107 471/5 PC **A02**/MF **A01**
Office of Naval Research, London (England).
9th Scientific Meeting of the International Epidemiological Association.
Conference rept.,
Michael Stek, Jr. 9 Sep 81, 8p Rept no. ONRL-C-4-81

The epidemiological conference discussed here was attended by some 900 participants from more than 60 countries. The program covered a wide range of topics related to the epidemiology and prevention of acute and chronic diseases. In this report, the author directs his attention to the discussions about tropical and infectious diseases, which are his areas of special interest.

AD-A107 506/8 PC **A03**/MF **A01**
Academy of Health Sciences (Army), Fort Sam Houston, TX. Dental Studies Office.
Evaluation of the Effectiveness and Efficiency of Preventive Dentistry Programs: Assessment of the Relationship between Past Dental Experience and Dental Sick Call in the Field.
Final rept. 1 Oct 80-30 Sep 81,
Warren A. Parker, John E. King, and David G. Brunner. Sep 81, 33p Rept no. 81-013

The relationship between dental sick call during Army field training exercises and prior dental experience of Army personnel was examined by analyzing data on 92 soldiers who reported to field support dental facilities for emergency conditions and data on 97 randomly selected soldiers who participated in the same exercises but did not report for dental emergencies in the field. Approximately 7745 Troops from different units participated over a time period of 117 days in 3 separate field exercises. The findings indicate an annual dental sick call rate of 234 per 1,000 soldiers. Caries was the most frequent cause of the emergencies (41.2%) followed by third molar/pericoronitis (15.9%), defective filling or fractured tooth (11.0%), gingival and peridontal problems (9.3%), and trauma (2.7%). The most frequent primary treatment rendered in the exercises was extraction (20.9% of primary treatment). When considering all treatment, perscription of medications was the most frequent (35.4%). Eighty-four percent (84%) of the patients were returned to duty without further evacuation. The finding most pertinent to the purpose of this study was that significantly more of the control group had completed the requirements of their last Army Oral Health Maintenance Program (AOHMP). That is, they were given a dental examination during their last birthmonth. The sick call group completed AOHMP requirements in 29.2% of the cases compared to 45.4% for the control.

AD-A107 541/5 PC **A04**/MF **A01**
Little (Arthur D.), Inc., Cambridge, MA. Dept. of Experimental Hematology.
Kinetics of Neutrophil-Releasing Activity of Post-Leukapheresis Plasma.
Final rept. 1 Feb 76-31 Jan 81,
Albert J. Roy. 1 Nov 81, 62p
Contract N00014-76-C-0489

Humoral factors are elaborated by animal and human granulocyte donors during filtration leukapheresis. Plasma obtained from leukapheresed rats (PPP) may be used to increase granulocyte yields in donors when given prior to leukapheresis. This effect is dose and time related. The titer of neutrophil releasing activity is related to the duration of pheresis. There is positive correlation between the donor pre- and postgranulocyte count and the titer of neutrophil releasing activity of the PPP. This activity in PPP is stable for up to three weeks at 4 C. The maximum granulocyte increment observed following injection of PPP occurs at three hours after injection. Intraperitoneal injection of PPP is ineffective.

HRP-0903306/9 PC**$20.00**/MF **E01**
Health Resources Administration, Hyattsville, MD.
Health Planning Reports: Abstracts. Volume 1, A-1 through A-7970.
Aug 81, 1149p
See also Volume 2, HRP-0903307.

The Health Planning Reports Abstracts are a compendium of citations and abstracts in the National Health Planning Information Center's (NHPIC) collection of health planning literature and government reports and studies. These volumes are intended for use by health planning agencies to facilitate access to all health planning documents announced by NHPIC. The abstracts are companion documents to the health planning reports indexes which have been printed and distributed by NHPIC. The indexes include the Health Planning Reports Subject Index, the Health Planning Reports Personal Author Index, the Health Planning Reports Corporate Author Index, and the Health Planning Reports Title Index.

HRP-0903307/7 PC**$20.00**/MF **E01**
Health Resources Administration, Hyattsville, MD.
Health Planning Reports: Abstracts. Volume 2, A-7971 through A-16333.
Aug 81, 1148p
See also Volume 1, HRP-0903306.

The abstracts are arranged numerically by abstract number. Each citation includes (1) personal author and/or corporate author; (2) title; (3) publication date; (4) number of pages; (5) availability statement; (6) identification number expressed as an eleven digit alpha-numeric code, i.e., HRP-0000111; and (7) a NHPIC abstract number, i.e., A100. To locate a specific health planning document first refer to the title and author indexes or refer to the subject index if you want to locate a specific planning subject or topic.

HRP-0903691/4 PC **A12**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Wisconsin, Volume 49, Part 1.
Aug 81, 256p
Contract PHS-HRA-232-80-0050
See also Volume 49, Part 2, HRP-0903692.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903692/2 PC **A15**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Wisconsin, Volume 49, Part 2.
Aug 81, 336p
Contract PHS-HRA-232-80-0050
See also Volume 49, Part 1, HRP-0903691.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903693/0 PC **A14**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Wyoming, Volume 50.
Aug 81, 310p
Contract PHS-HRA-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903694/8 PC **A18**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Virginia, Volume 46, Part 1.
Aug 81, 406p
Contract PHS-HRA-232-80-0050
See also Volume 46, Part 2, HRP-0903695.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, re-

cruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903695/5 PC **A19**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Virginia, Volume 46, Part 2.
Aug 81, 445p
Contract PHS-HRA-232-80-0050
See also Volume 46, Part 1, HRP-0903694.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903696/3 PC **A16**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: West Virginia, Volume 48, Part 1.
Aug 81, 366p
Contract PHS-HRA-232-80-0050
See also Volume 48, Part 2, HRP-0903697.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903697/1 PC **A15**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: West Virginia, Volume 48, Part 2.
Aug 81, 330p
Contract PHS-HRA-232-80-0050
See also Volume 48, Part 1, HRP-0903696.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903698/9 PC **A16**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Washington, Volume 47.
Aug 81, 361p
Contract PHS-HRA-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903699/7 PC **A19**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Idaho, Volume 13.
Aug 81, 434p
Contract PHS-HRA-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903700/3 PC **A16**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Illinois, Volume 14, Part 1.
Aug 81, 363p
Contract PHS-HRA-232-80-0050
See also Volume 14, Part 2, HRP-0903701.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903701/1 PC **A20**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Illinois, Volume 14, Part 2.
Aug 81, 455p
Contract PHS-HRA-232-80-0050
See also Volume 14, Part 1, HRP-0903700.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903702/9 PC **A14**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Indiana, Volume 15, Part 1.
Aug 81, 307p
See also Volume 14, Part 2, HRP-0903703.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903703/7 PC **A15**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Indiana, Volume 15, Part 2.
Aug 81, 345p
Contract PHS-HRA-232-80-0050
See also Volume 15, Part 1, HRP-0903702.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903704/5 PC **A14**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kansas, Volume 16, Part 1.
Aug 81, 325p
Contract PHS-HRA-232-80-0050
See also Volume 16, Part 2, HRP-0903705.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903705/2 PC **A17**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kansas, Volume 16, Part 2.
Aug 81, 387p
Contract PHS-HRA-232-80-0050
See also Volume 16, Part 1, HRP-0903704.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903706/0 PC **A12**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kentucky, Volume 17, Part 1.
Aug 81, 258p
Contract PHS-HRA-232-80-0050
See also Volume 17, Part 2, HRP-0903707.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903707/8 PC **A17**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kentucky, Volume 17, Part 2.
Aug 81, 376p
Contract PHS-HRA-232-80-0050
See also Volume 17, Part 1, HRP-0903706.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903708/6 PC **A10**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Louisiana, Volume 18, Part 1.
Aug 81, 225p
Contract PHS-HRA-232-80-0050
See also Volume 18, Part 2, HRA-0903709.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903709/4 PC **A11**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Louisiana, Volume 18, Part 2.
Aug 81, 247p
Contract PHS-HRA-232-80-0050
See also Volume 18, Part 1, HRP-0903708.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903710/2 PC **A10**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Massachusetts, Volume 21.
Aug 81, 221p
Contract PHS-HRA-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903711/0 PC **A13**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Maine, Volume 19.
Aug 81, 286p
Contract PHS-HRA-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the

same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903712/8 PC **A13**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Maryland, Volume 20.
Aug 81, 285p
Contract PHS-HRA-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903713/6 PC **A14**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Tennessee, Volume 42, Part 1.
Aug 81, 318p
Contract PHS-HRA-232-80-0050
See also Volume 42, Part 2, HRP-0903714.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903714/4 PC **A18**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Tennessee, Volume 42, Part 2.
Aug 81, 413p
Contract PHS-HRA-232-80-0050
See also Volume 42, Part 1, HRP-0903713.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903715/1 PC **A12**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Pennsylvania, Volume 38, Part 1.
Aug 81, 252p
Contract PHS-HRA-232-80-0050
See also Volume 38, Part 2, HRP-0903716.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903716/9 PC **A15**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Pennsylvania, Volume 38, Part 2.
Aug 81, 344p
Contract PHS-HRA-232-80-0050
See also Volume 38, Part 1, HRP-0903715.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903717/7 PC **A07**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Rhode Island, Volume 39.
Aug 81, 138p
Contract PHS-HRA-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903718/5 PC **A15**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: South Carolina, Volume 40.
Aug 81, 337p
Contract PHS-HRA-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903719/3 PC **A15**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: South Dakota, Volume 41, Part 1.
Aug 81, 346p
Contract PHS-HRA-232-80-0050
See also Volume 41, Part 2, HRP-0903720.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903720/1 PC **A11**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: South Dakota, Volume 41, Part 2.
Aug 81, 235p
Contract PHS-HRA-232-80-0050
See also Volume 41, Part 1, HRP-0903719.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903721/9 PC **A15**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Utah, Volume 44.
Aug 81, 335p
Contract PHS-HRA-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903722/7 PC **A10**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Vermont, Volume 45.
Aug 81, 209p
Contract PHS-HRA-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903723/5 PC **A12**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Texas, Volume 43, Part 1.
Aug 81, 265p
Contract PHS-HRA-232-80-0050
See also Volume 43, Part 2, HRP-0903724.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903724/3 PC **A15**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Texas, Volume 43, Part 2.
Aug 81, 335p
Contract PHS-HRA-232-80-0050
See also Volume 43, Part 1, HRP-0903723 and Volume 43, Part 3, HRP-0903725.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903725/0 PC **A13**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Texas, Volume 43, Part 3.
Aug 81, 296p
Contract PHS-HRA-232-80-0050
See also Volume 43, Part 2, HRP-0903724 and Volume 43, Part 4, HRP-0903726.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903726/8 PC **A14**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Texas, Volume 43, Part 4.
Aug 81, 316p
Contract PHS-HRA-232-80-0050
See also Volume 43, Part 3, HRP-0903725 and Volume 43, Part 5, HRP-0903727.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903727/6 PC **A14**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Texas, Volume 43, Part 5.
Aug 81, 315p
Contract PHS-HRA-232-80-0050
See also Volume 43, Part 4, HRP-0903726.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903731/8 PC **A03**/MF **A01**
Maryland Statewide Health Coordinating Council, Baltimore.
Determination of System Needs, and Associated Data Needs, SHCC Guidelines for Fourth HSPs (Section IX).
Sep 81, 31p

Each Health Systems Agency (HSA) in its Health Systems Plan (HSP) is required to establish projected needs for health care resources. Methodologies are selected or developed for each of these need determinations. The methodologies are mathematical formula that use available information about past and present need or usage as related to future need or usage. Methodologies agreed upon in Maryland for the follow-

ing specific service settings are presented: acute inpatient bed needs (obstetric, pediatric, medical/surgical/gynecological/addictions); longterm care bed needs (nursing homes); alcoholism intermediate care bed needs; megavoltage radiation therapy machine needs; and primary care physician needs. In terms of the analyses and need determinations resulting from the application of the methodologies to these service settings, it should now be feasible to prepare a State Health Plan made up of truly coordinated HSPs. The methodologies deal primarily with availability of service resources, which is only one of the health system characteristics. These statewide methodologies, with the resulting net need determinations and associated resource requirements and recommended actions, shall apply throughout Maryland.

HRP-0903735/9 PC **A08**/MF **A01**
Rensselaer Polytechnic Inst., Troy, NY. School of Management.
Economic Impact and Project Selection Methodology for Certificate of Need.
Midterm rept.
Sep 79, 174p
Sponsored in part by New York State Health Planning Commission, New York.

The results of the first half of the Rensselaer Polytechnic Institute study of the Certificate of Need (CON) process in New York State are presented. The objective was to address the integration of the CON process and the health planning process in the context of the limited resources available to spend on health care. The primary thrust of the project is to estimate both capital and operating expenditures for CON projects and to develop methodologies to utilize these economic factors in combination with regional/state health plans to aid in the selection of approved CON projects. This report includes background information on the CON process; analysis and the results of the development of the Project Classification System (PCS); a description of the methodology and data to be used in calculating the estimates for the economic impact measures (EIMs) which, for the purposes of this study, include the concepts of capital cost, annual operating cost, and souce of revenues; the approach taken in the selection of the health impact measures (HIMs); and the Health Systems Agency review process. A model will be developed and tested.

HRP-0903737/5 PC **A02**/MF **A01**
Merrimack Valley Health Planning Council, Inc., Lawrence, MA.
The Health Systems Agency Role in Building Primary Care Systems at the Local Level: A Recent Example,
Robert C. Starratt. Nov 80, 18p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

The task of the Health Systems Agency (HSA) in working with consumers and providers of primary care in the Greater Lawrence, Massachusetts area to develop the Greater Lawrence Family Health Center (FHC) is recounted in detail. In this discussion of HSA involvement, attention is directed to the HSA interaction with a local hospital; involvement with a consortium of local consumers and providers; and the HSA role as mediator and advisor, facilitator, and consultant. The HSA representative was involved in researching and presenting several different models for discussion and modification. The model finally proposed, although simplistic, proved sufficient to support the potential feasibility of locating a National Health Service Corps (NHSC) site in the Lawrence-Methuen area. The model was generally considered to be favorable by most involved parties, with the exception of area physicians, many of whom objected to the area hospitals' increasing their involvement in the delivery of primary care. The site, officially known as the Greater Lawrence FHC, was opened with a staff consisting of a bilingual (English-Spanish) NHSC family physician, a bilingual nurse's aid, one bilingual clerk typist, one bilingual clerk receptionist, and a half-time administrative coordinator. Problems encountered by the FHC and the assistance provided by the HSA are reviewed.

HRP-0903740/9 PC **A02**/MF **A01**
Merrimack Valley Health Planning Council, Inc., Lawrence, MA.
Analysis of Nursing Manpower Shortages in Merrimack Valley Home Health Care Agencies, Part I: The Nature and Severity of the Shortage.
Oct 81, 20p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

A survey of home health care agencies was conducted in February 1981 in the Merrimack Valley region in the Northeast corner of Massachusetts. The objective was to ascertain the nature and the severity of any nursing personnel shortage and to determine some of the factors contributing to these shortages. By April 1981, all 14 agencies had responded to the questionnaire. The following were among the survey findings: (1) 82 percent of all home health care agencies reported problems in filling vacant nurse positions and in meeting requests for nursing services; (2) except for filling home health aide (HHA) positions where the difficulty seems to be equal for both, temporary agencies demonstrated more severe problems than the visiting nurse agencies; (3) contracting did not appear to be a solution that any of the agencies needing to do so found attractive because of high costs, poor quality, and little control over employees; and (4) for the most part, the problems of filling positions appeared more severe for lesser-skilled personnel than for the high-skilled registered nurse and licensed practical nurse personnel. A copy of the questionnaire is included.

HRP-0903747/4 PC **A10**/MF **A01**
Health Systems Agency of Southeastern Pennsylvania, Philadelphia.
Population-Based Mental Health Needs Assessment Methodology for Use in HSA/SP.
Final rept.
Dec 79, 217p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD. Prepared by A. T. Kearney, Inc.

The Health Systems Agency of Southeastern Pennsylvania (HSA/SP) contracted A. T. Kearney, Inc., to develop a population methodology for assessing gross need and unmet need in the area of mental health. This study report includes the following: an extensive literature search; an assessment of the current state-of-the-art methodologies with descriptions of their relative merits and disadvantages; a description of two local needs assessments now being conducted in the Southeastern Pennsylvania region and a detailed description of three needs assessment methodologies which are appropriate for HSA/SP. The mental health needs assessment methodology recommended for HSA/SP and described in detail involves the integration of several basic approaches: baseline data collection; social indicator approach; key informant approach; community forum approach; and community survey approach. The methodology is long-ranged, is expected to take three to five years to complete, and is a phase process.

HRP-0903770/6 PC **A12**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: New Jersey, Volume 30.
Aug 81, 271p
Contract PHS-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903771/4 PC **A09**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Nevada, Volume 28.
Aug 81, 187p
Contract PHS-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903772/2 PC **A09**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: New Hampshire, Volume 29.
Aug 81, 187p
Contract PHS-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903773/0 PC **A11**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: New York, Volume 32, Part 1.
Aug 81, 234p
Contract PHS-232-80-0050
See also Part 2, HRP-0903774.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower,

particularly in monitoring the dynamics of nursing manpower.

HRP-0903774/8 PC **A15**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: New York, Volume 32, Part 2.
Aug 81, 329p
Contract PHS-232-80-0050
See also Part 1, HRP-0903773.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903775/5 PC **A11**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: New Mexico, Volume 31.
Aug 81, 243p
Contract PHS-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903776/3 PC **A16**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: North Dakota, Volume 34.
Aug 81, 359p
Contract PHS-232-80-0050

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903777/1 PC **A15**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: North Carolina, Volume 33, Part 1.
Aug 81, 330p
Contract PHS-232-80-0050
See also Part 2, HRP-0903778.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

HRP-0903778/9 PC **A18**/MF **A01**
National League for Nursing, Inc., New York. Div. of Research.
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: North Carolina, Volume 33, Part 2.
Aug 81, 416p
Contract PHS-232-80-0050
See also Part 1, HRP-0903777.

This volume is a component part of the third edition of the State and Local Report Series Employment, Mobility and Personal Characteristics of Newly Licensed Nurses. The data summaries for this edition (1979) were prepared by the National League for Nursing (NLN), under contract with the Health Resources Administration, from data collected by the National League for Nursing in their annual surveys of newly licensed nurses. The first two editions (1977 and 1978) are available from the NLN. The series consist of 50 volumes, with some volumes having up to 5 parts. Volume 1 (The State Summaries) provides national summary information by State, for all variables, and Volumes 2-50 (individual State reports) provides the same information for Health Service Area's (HSA's) and counties within the HSAs of the State. These reports contain timely, up-to-date and relevant statistical information of interest to questions on the supply, demand, and distribution of nurses. The data will be helpful to those persons responsible for planning, recruiting, or research in the area of health manpower, particularly in monitoring the dynamics of nursing manpower.

PB82-106816 PC **A03**/MF **A01**
Northwestern Univ., Evanston, IL.
Optimal Control of a Network of Whole Blood Banks: Target Inventory Levels for a Hospital Blood Bank or a Decentralized Regional Blood Banking System.
Final rept. 1 May 72-27 Sep 77,
Morris A. Cohen, and William P. Pierskalla. Mar 78, 42p NCHSR-81-179
Grants PHS-HS-00786, PHS-GK-40034
Prepared in cooperation with Pennsylvania Univ., Philadelphia.

In a recent paper by Brodheim, Hirsch and Prastacos (1976), curves relating recommended whole blood/red cell inventory levels and mean daily demand were developed for various specified shortage rates. This paper extends their analysis to establish a simple decision rule which yields the optimal inventory level for each blood type as a function of various factors in the blood bank environment. In using this rule it is not necessary for the blood bank administrator to choose a shortage rate for system operation since the inventory level recommended by the rule reflects the optimal trade-off between shortages and outdates. The elimination of the requirement to pick and justify a shortage rate exclusive of other system outcome measures greatly simplifies the administrator's decision problem. For any given inventory level it is possible to compute the anticipated shortage rate when operating at that level. In the cases studied, it is shown later in the paper that when using the inventory level obtained from the optimal decision rule, the 'implicit' shortage rate is near .001 for large volume blood types and .01 for rarer or small volume types. On the other hand, the outdate rate is shown, in general, to be quite sensitive to certain specific factors in the blood bank management and environment (age of supply, transfusion to crossmatch ratio, and the crossmatch release period). Depending on these factors, the rule yields outdate rates which vary from .001 to .07.

PB82-106832 PC **A03**/MF **A01**
State Univ. of New York Upstate Medical Center, Syracuse.
Fire Department Participation in the Identification and Transportation of Victims of Thermal Injury 'In Central New York State' Exploratory Study.
Final rept.,
William R. Clark, Jr., Bruce L. Riddle, and Dennis Lerner. 26 Feb 81, 50p
Contract EMW-02986

The objective of this study was to establish the role of the fire service in the identification and transportation of burn victims from the scene of fire department service to medical facilities. Burn injury data collected in Central New York State under the National Burn Care Demonstration (DHHS) and fire casualty and incident reports submitted by local fire departments through the New York State Office of Fire Prevention and Control to the U.S. Fire Administration along with locally gathered fire department records were compared. Rates of fire service participation in burn patient triage were compared with total burn incidence records in hospital records in the Central New York Region. It was found that the number of burn victims having some contact with the fire service was small in proportion to the total number of thermal burns occurring within the region.

PB82-107525 PC **A06**/MF **A01**
Kappa Systems, Inc., Arlington, VA.
Patient Tracking for High Blood Pressure Control.
Final rept.
Dec 79, 107p NIH/NHLBI-77-3
N01-HV-52942

The study overviewed existing systems to 'track' or follow patients under treatment, assessed the actual or potential success of systems, and formulated a model tracking system. The report is in the form of a manual for planning and operating a patient tracking system for improved control of high blood pressure in a variety of health care settings.

PB82-108614 PC **A03**/MF **A01**
Computer Horizons, Inc., Cherry Hill, NJ.
An Analysis of Research Publications Supported by NIH (National Institutes of Health) 1970-1976: NIH and NCI (National Cancer Institute).
Final program evaluation rept.
Dec 80, 42p NIH-73-2
N01-OD-3-2109

Presents an analytic characterization of 1970-1976 research publications supported by the National Cancer Institute. A parallel report has been prepared for each of the National Institutes of Health (except NIA and NIEHS for which sufficient data were not available). These reports are an outgrowth of the collaborative association between Computer Horizons Inc. (CHI) and NIH on the development and application of indicators of biomedical research activity. The present group of reports is intended to introduce to NIH Bureaus, Institutes and Divisions (B/I/Ds) a new set of tools of analysis, called Bibliometrics, for program review and evaluation in providing sensitive indicators of activity and change in scientific productivity.

PB82-110214 PC **A08**/MF **A01**
Management Sciences for Health, Inc., Boston, MA.

Self-Evaluation for Rape-Responsive Organizations. Volume II: A Self-Evaluation Guide for Programs Serving Victims of Rape.
Final rept.,
Susan F. Klein, and Jeanne McCormack. Apr 78, 158p NIMH-77-07-2
PHS-HSM-278-76-0062
See also Volume 1, PB82-110206 and Volume 3, PB82-110222.

This study resulted in the preparation of a five volume final report on self-evaluation. Volume II gives specific illustrations of the principles, techniques, and tools described in Volume I as they apply to evaluate the services provided to rape victims. Volumes II and IV also provide useful evaluation ideas for both those who are primarily engaged in community education, particularly in the area of prevention, as well as those who do community education as an adjunct to providing services to victims.

PB82-110222 PC **A07**/MF **A01**
Management Sciences for Health, Inc., Boston, MA.
Self-Evaluation for Rape-Responsive Organizations. Volume III: A Self-Evaluation Guide for Rape-Responsive Community Education Programs.
Final rept.,
Susan F. Klein, and Jeanne McCormack. Apr 78, 128p NIMH-77-07-3
PHS-HSM-278-76-0062
See also Volume 2, PB82-110214 and Volume 4, PB82-110230.

This study resulted in the preparation of a five volume final report on self-evaluation. Volume III gives specific illustrations of the principles, techniques, and tools described in Volume I as they apply to evaluating various types of rape-related community education.

PB82-110230 PC **A03**/MF **A01**
Management Sciences for Health, Inc., Boston, MA.
Self-Evaluation for Rape-Responsive Organizations. Volume IV: A Self-Evaluation Guide for Rape Responsive Training Programs.
Final rept.,
Jeanne McCormack, and Susan F. Klein. Apr 78, 30p NIMH-77-07-4
PHS-HSM-278-76-0062
See also Volume 3, PB82-110222.

This study resulted in the presentation of a five volume final report on self-evaluation. Volume IV gives specific illustrations of the principles, techniques, and tools described in Volume I as they apply to evaluating staff training. As with Volumes II and III, this volume should be read in tandem with Volume I after the reader has familiarized her/himself with the evaluation process and has narrowed down the evaluation questions. The approaches presented in these volumes were drawn primarily from the social, management, and administrative sciences.

PB82-115932 PC **A02**/MF **A01**
Johns Hopkins Univ., Baltimore, MD. School of Hygiene and Public Health.
Epidemiologic Study of Rocky Mountain Fever (RMSF).
Annual rept. 1 Jul 79-31 May 80,
Harvey R. Fischman, Charles L. Wisseman, Jr., and David L. Sorley. 9 Jun 80, 14p DAB-VDP-06-128
Contract N01-AI-9-2622

The first year of the project was concerned primarily with tooling up, preparing reagents and training new personnel. Reagents for serological procedures have been prepared. Dog sera has been obtained from nine veterinary clinics and tested for RMSF antibody. Dog ticks are being collected on a monthly basis for examination. An intensive surveillance is underway for human cases of RMSF. Selected physicians (350) from seven high incidence counties are being called on a biweekly basis to determine whether suspect cases of RMSF have been seen. Letters have been sent to all appropriate physicians, hospitals and emergency rooms in the seven counties informing them of the nature of the study and providing them with essential information that the authors hope will improve reporting.

PB82-120635 PC **A07**/MF **A01**
United States-Japan Cooperative Cancer Research Program.
The United States-Japan Cooperative Cancer Research Program Progress Report, April 1980 through March 1981.
1981, 145p

This report summarizes activities of the U.S.-Japan Cooperative Cancer Research Program for the Japanese Fiscal Year 1980, the period between April 1, 1980 and March 31, 1981. Following the very successful conclusion of the first five-year period, the U.S.-Japan Cooperative Cancer Research Program entered into the second five-year period in April 1979, with substantial restructuring of the Program intended to provide greater flexibility in operation to meet the needs of the changing interests and new research areas emerging in the recent progress of cancer research. The most important modification has been consolidation of the previous eleven areas of cooperation into four major areas: (1) Etiology; (2) Biology and Diagnosis; (3) Treatment; and (4) Interdisciplinary Program and Coordination. The Interdisciplinary Program and Coordination Area is intended to serve the function of general coordination of the other three areas, consideration of new programs of scientific merit, facilitation of interdisciplinary programs (including those on organ sites), and sponsoring of interdisciplinary meetings.

PB82-129636
(Order as PB82-129628, PC **A05**/MF **A01**)
Chinese Academy of Medical Sciences, Beijing. Capital Hospital.
A New Method for Determination of Anti-Double Strand DNA Antibodies, Trypanosoma Equiperdium Immunofluorescent Method,
Shizheng Xu, Huizhen Wang, and Hongjiong Li. Sep 81, 6p
Included in Chinese Medical Jnl., v94, n9 p549-566 1981.

A new method of determining anti-double strand DNA antibody by blood smears of mice infected with Trypanosoma equiperdum used as a substrate for immunofluorescent technic is described. Sera from 547 persons, including 62 patients with systemic lupus erythematosus (SLE), 66 with other connective tissue diseases (CTD), 288 with miscellaneous diseases, and 129 healthy medical workers and blood donors were determined. The results were all 20 patients with active SLE showed strongly positive reactions; only 4 of 42 patients with inactive SLE showed weakly positive reactions; all other CTD patients except 1 and all patients with miscellaneous diseases as well as healthy controls showed negative reactions. This test demonstrates very good correlation in comparison with the Farr assay and has some advantages over it, such as simplicity of performance, reliability and constancy of results and SLE specificity. Moreover, the method seems applicable to the detection of antinuclear antibody (ANA) under certain conditions. It is of value in diagnosis and follow up of SLE.

PB82-129651
(Order as PB82-129628, PC **A05**/MF **A01**)
Beijing Tropical Medicine Research Inst. (China).
Present Situation of Filariasis in China,
Huilan Zhong, Lianyin He, and Weiji Cao. 1981, 18p
Paper presented at the Joint Conference (15th) on Parasitic Diseases of the Japan-US Cooperative Medical Science Program held in Tsukuba, Japan, on July 29-August 1, 1980.
Included in Chinese Medical Jnl., v94 n9 p567-584 1981.

This paper presents a brief review of a historical sketch, epidemiology, symptomatology, diagnosis, treatment, prevention and eradication of filariasis in China.

PB82-129669
(Order as PB82-129628, PC **A05**/MF **A01**)
Shanghai First Medical Coll. (China).
A New Concept on the Natural Course of Hepatocellular Carcinoma,
Zhaoyou Tang. 1981, 4p
Included in Chinese Medical Jnl., v94 n9 p585-588 1981.

Based upon mass screening of hepatocellular carcinoma (HCC) using alpha fetoprotein (AFP) as tumor marker and long term follow-up study, a new concept concerning the natural course of HCC has been developed. Adverse to the previous concept of relative short survival, HCC exists and develops for a relatively long period before symptoms occur. A group of pathologically proven HCC cases receiving nonresectional treatment revealed that the median survival of subclinical HCC was 14 months versus 3 months in clinical HCC. 10 more months should be added from the first appearance of low but gradually increasing AFP of subclinical HCC, so the natural course of HCC is about 24 months. This relatively long period provides much more opportunity for successful treatment of this grave malignancy if it is detected early.

PB82-129693
(Order as PB82-129628, PC **A05**/MF **A01**)
Academia Sinica, Beijing (China). Inst. of Genetics.
Case of Hereditary (4;5) Translocation Discovered Prenatally,
Nianhu Sun, Fengyun Wang, Jinxia Li, and Xianting Zhou. 1981, 4p
Included in Chinese Medical Jnl., v94 n9 p597-600 1981.

This paper reports a very rare case of hereditary (4;5) translocation inherited by 3 generations.

PB82-129719
(Order as PB82-129628, PC **A05**/MF **A01**)
Zhanjiang Medical Coll. (China).
Determination of Estrogen Receptor in Human Colon Cancer Tissue with Labeled Fluorescence Estradiol (Fluorescein Isothiocyanate),
Nanying Zhu, Zinhan Cai, Lili Wu, and Rongbi Zou. 1981, 4p
Included in Chinese Medical Jnl., v94 n9 p607-610 1981.

Estrogen receptor (ER) with labeled fluorescence estradiol is determined in 33 samples of colon cancer tissue. ER is positive in 10. The results are similar to Alford's, but the method the authors used is simpler and feasible.

PB82-129727
(Order as PB82-129628, PC **A05**/MF **A01**)
Chongqing Medical Coll. (China). Second Hospital.
Orthoplasty for Bile Duct Stricture at the Liver Hilum, A Preliminary Report of 5 Cases,
Ruitu Ran. 1981, 6p
Included in Chinese Medical Jnl., v94 n9 p611-616 1981.

The current operative treatment for stricture of the bile ducts at the liver hilum has been anastomosis of the proximal bile duct with a defunctioned limb of the jejunum. Such an operation bypasses a functioning papilla and leaves the proximal biliary system open to possible ascending infection from the intestines. This study is a preliminary report of 5 clinical cases of this type of stricture successfully treated by plastic repair of the bile duct at the hilum without intestinal anastomosis. The functioning papilla, a prerequisite for this operation, prevents ascending infection in the biliary system.

PB82-131061 PC **A05**/MF **A01**
Elmendorf (Mary), Washington, DC.
Changing Patterns of Fertility: The Impact of Contraceptive Technology on a Maya Village.
1980, 92p AID-PN-AAH-954
Grant AID/pha-G-1184
Sponsored in part by Research Inst. for the Study of Man, New York.

Acceptance and implementation of strategies to limit family size have increased among the women of Chan Kom, a Mayan peasant village located in Yucatan. This report explores the factors supporting fertility control by analyzing the counseling and services of the family planning program and the age, health condition, and desired number of children of women who accept and use some form of birth control. Also assessed are socioeconomic variables such as the education level of women and children and income-generating work of women and men both in and outside the village.

PB82-131095 PC **A08**/MF **A01**
Agency for International Development, Tegucigalpa (Honduras).
Assessment of the Public Health Sector in Honduras, 1975-1985.
Jun 80, 175p PN-AAH-878

The Honduran health sector is complex, ranging from a sophisticated teaching hospital in Tegucigalpa to health workers providing simple treatment in village homes. This health sector assessment concentrates on human resources, management, logistics, and financing in three priority areas--communicable disease control, environment and sanitation, and personal health care.

PB82-131616 PC **A08**/MF **A01**
Orkand Corp., Silver Spring, MD.
Design of an Evaluation of PSRO Long-Term Care Review.
Final rept.,
Maura Bluestone, Eugene Rubel, and Franz Jaggar.
2 Oct 81, 164p TR-81W-038
Contract HCFA-500-80-0049

This is the final report from a project to design the evaluation for the long term care review component of the Professional Standards Review Organization (PSRO) program. A research design was formulated to test hypotheses of PSRO LTC review effectiveness in assuring appropriate utilization of services by Federal patients and adequate quality of service. As part of the assessment process requisite data sources were identified. A generic methodology which is generalizable to other long term care applications is provided, sixteen hypotheses are specified, a long term care patient flow model, a interstate PSRO model and intrastate PSRO model are conceptualized, and appropriate analytical techniques are recommended. A glossary and references are provided. Implementation of the evaluation design was not within the scope of this project. The authors conclude that it is possible to test specific hypotheses and evaluate PSRO utilization and expediture effects. Given the costs of primary data collection associated with quality of care hypotheses this area is less promising.

PB82-133398 PC **A02**/MF **A01**
Family Hospital and Nursing Home, Milwaukee, WI.
Evaluation of a New Community Rape Treatment Center,
Conrad L. Sobczak. May 79, 15p NIMH-81-51
Grant R01-MH-28996
Portions of this document are not fully legible.

A new medical treatment and counseling program for victims of rape and their families was evaluated. Instruments for data collection and monitoring were developed. The input of the program on the community was measured. A model treatment program which facilitated linkages with other agencies was designed and successfully operated.

PB82-133695 PC **A07**/MF **A01**
Health Care Financing Administration, Baltimore, MD. Office of Research, Demonstrations, and Statistics.
Physicians and Financial Incentives,
Jon R. Gabel, Judith Taylor, Nancy T. Greenspan, and Martha O. Blaxall. Dec 80, 142p HCFA/PUB-03067

In 1975, the Division of Health Insurance Studies of the Social Security Administration, the predecessor to Health Care Financing Administration's Office of Research, Demonstrations, and Statistics (ORDS), funded approximately 10 research projects on costing. The papers in this volume focus on the way physicians are paid by third party payers rather than the size and significance of patient cost-sharing. Together with other research projects from HEW's Health Resources Administration and in-house HCFA research, the 14 papers contained in this volume summarize selected project findings.

PB82-133711 PC **A06**/MF **A01**
American Public Welfare Association, Washington, DC.
Federal Regulations, Statutes, and Reporting Requirements as Barriers to Efficient Medicaid Program Operations,
Nancy Greenspan. Jul 81, 114p
Grant SRS-18-97959

State administrators believe that Medicaid is a well-run program, but that federal requirements do not always recognize state concerns and efforts to ensure the efficiency and fiscal integrity of program operations. This project is based on discussions between state and federal officials; it recognizes important and longstanding concerns of state administrators, who perceive some current federal requirements as barriers to meeting their primary objectives: to make the best use of available resources; to operate programs efficiently to minimize cutbacks in service or eligibility; and to manage cutbacks so that the least harm is done to program recipients.

PB82-133943 Not available NTIS
National Bureau of Standards, Washington, DC.
Pilot Program for the National Environmental Specimen Bank. Phase I.
Final rept.,
Sally H. Harrison, Rolf Zeisler, and Stephen A. Wise. May 81, 6p
Pub. in Environmental Protection Agency, Washington, DC. Rept. no. EPA/600/S1-81-025, 6p May 81.

This work was performed under a joint NBS/EPA research program to develop state-of-the-art protocols for the sampling, storage, and analysis of biological and environmental-type matrices. This report summarizes the procedures used in the initial phase of a pilot program for determining the feasibility of the National Environmental Specimen Bank. A special clean-laboratory/storage facility has been designed and completed for use in this program. Detailed protocols for sampling, storage, and analysis of human liver samples have been designed for this study. The implementation of these protocols for human liver samples is described in this report.

PB82-133968 Not available NTIS
National Bureau of Standards, Washington, DC.
Brain Destruction Alone Does Not Elevate Brain Aluminum.
Final rept.,
Roger D. Traub, Theodore C. Rains, Ralph M. Garruto, and D. Carleton Gajdusek. Aug 81, 5p
Pub. in Neurology 31, n8 p986-990 Aug 81.

Graphite furnace atomic-absorption spectroscopy was used to measure aluminum concentrations in brain samples from 33 patients dying from a variety of neurologic diseases. Four samples from patients dying of nonneurologic causes also were studied. Nine samples (one from each of nine patients) of Creutzfeldt-Jakob disease brain contained normal amounts of aluminum. Aluminum was increased in 9 of 18 brain specimens with seven different pathologic processes. This included three of seven Alzheimer disease, two of three Huntington disease, two of two Parkinson disease, one of one progressive supranuclear palsy, one of one acoustic neuroma, one of two cerebrovascular disease, and one of two Guamanian amyotrophic lateral sclerosis (ALS). Aluminum was normal in the remaining samples (four normal, two ALS, one multiple sclerosis, one Pick disease, and two Guamanian parkinsonism-dementia). The significance of high aluminum values is not clear, but the normal values from the Creutzfeldt-Jakob cases imply that neuronal destruction per se need not lead to accumulation of aluminum in the brain.

PB82-134511 PC **A03**/MF **A01**
Cedars-Sinai Medical Center, Los Angeles, CA.
Rape Response: A Research Demonstration Project,
Susan Brown. Jun 78, 38p NIMH-81-49
Grant PHS-R01-MH-29025

A model service delivery system aimed at counseling and intervention in rape crisis was developed. Volunteer counselors were selected and trained. Male counselors were used and their impact on victims was determined. Other aspects of the research included: counseling intervention services to potential rapists; referral services; extended consultant and training services; and a public information campaign.

PB82-135203 PC **A04**/MF **A01**
Applied Management Sciences, Inc., Silver Spring, MD.
Comparison of the Caries-Preventive Effects of Neutral Sodium Fluoride and Acidulated Phosphate Fluoride.
Final rept. 30 Sep 77-29 Sep 81,
Craig C. Sherbrooke, Lawrence A. Thibodeau, Carolyn K. Goodman, and Laurie B. Follit. Sep 81, 55p G-124, NIDR/CR-81-09
Contract N01-DE-7-2411

The purpose of this study was to determine the caries-preventive effects of neutral sodium fluoride and acidulated phosphate fluoride when each is used daily as a tablet or as a rinse. Approximately 1,300 students participated in the 3-year longitudinal clinical trial. Visual-tactile examinations were conducted four times. Findings indicate the control group had larger mean DMFS increments than either fluoride treatment and either method of administration. While tablets performed better than rinses and APF better than NaF, none of the differences was statistically significant.

PB82-135237 PC **A04**/MF **A01**
Veterans Administration Hospital, Indianapolis, IN.
Peer Review,
Sara A. Healey. Jun 78, 58p VA/NPR-132

This report describes guidelines developed for the supervisor/coordinator to evaluate nursing practice by peers who are engaged in similar functions. Technical, human, and conceptual skills were evaluated by the nurses for themselves and for their peers. Significant correlation was found between the self-evaluation and the peer evaluation in the area of technical skills, but no significant correlation in areas of human and conceptual skills. A bibliography and sample review forms are included.

PB82-135252 PC **A05**/MF **A01**
Veterans Administration Hospital, Tuscaloosa, AL.
The Community Mental Health Project: Pilot Project.
Final rept.,
Elizabeth W. Cleino. Apr 70, 93p VA/NPR-84

This study is the final report of a pilot project conducted by the Community Health Committee, Tuscaloosa Veterans Administration (VA) Hospital, to determine the feasibility of a community based treatment program in connection with a neuro-psychiatric VA Hospital. The six month project was carried out in a rural county where travelling teams provided mental health services for a selected group of discharged veterans. The study concludes that the Community Mental Health Project demonstrates the feasiblity and practicality of extending services to their home community. The travelling team found that by working with families in their own setting the whole truth can be shared and treatment can be more effectively planned and carried out. Recommendations include establishing an extended treatment project to bring community services to a larger area. The scope of the extended project is foreseen to include attention to the existing cultural patterns in the community and work with local citizen groups to improve the general mental health of the community.

PB82-135757 PC **A10**/MF **A01**
Health Care Financing Administration, Baltimore, MD. Office of Research, Demonstrations, and Statistics.
Issues in Physician Reimbursement: Conference Proceedings,
Nancy T. Greenspan. Aug 81, 217p HCFA/PUB-03121

The Health Care Financing Administration (HCFA) funded surveys to collect data on physicians' costs and incomes for the years 1975 through 1978. In 1978, HCFA supported the analysis of these data. Although the major focus was the analysis of physician practice costs and incomes for use in refining the Medicare Economic Index, the breadth of the data allowed numerous other reimbursement issues to be addressed. This book contains the first reports emanating from this research.

PB82-135815 PC **A03**/MF **A01**
Health Care Financing Administration, Baltimore, MD. Office of Research, Demonstrations, and Statistics.
National Monthly Medicaid Statistics, April 1979.
Final rept.,
Richard Beisel, and Robert Terrell. May 81, 50p HCFA/PUB-03098
See also report for Mar 79, PB81-198137.

The publication is a monthly report containing data on medical assistance payments and recipients of services under Title XIX of the Social Security Act (Title XIX). Medicaid is an assistance program designed to provide medical assistance to specified groups of needy individuals. Information is compiled and reported by each State and/or jurisdictional agency administering an approved Title XIX program on Federal Report Form SRS-NCSS-120: Monthly Statistical Report on Medical Care. Information presented include medical payments by form of payment, payments to medical vendors by type of service, number of recipients in whose behalf medical vendor payments were made, and data related to screening services under the Early and Periodic Screening Diagnosis and Treatment program.

PB82-136029 PC **A05**/MF **A01**
Chinese Medical Association, Beijing.
Chinese Medical Journal. Volume 94, Number 10, October 1981.
Oct 81, 84p
See also Volume 94, Number 7, PB81-248700 and PB82-136037 thru PB82-136060.Color illustrations reproduced in black and white.

Contents:
- Clinical analysis of 120 cases of primary amenorrhea;
- Influence of late-pregnancy toxemia on the fetus;
- Reevaluation of fosfomycin--clinical and laboratory studies;
- Studies on the rapid detection of dengue virus antigen by immunofluorescence and radioimmunoassay;
- Astrovirus in autumn infantile gastroenteritis;
- Anticomplement immunoenzymatic method of detecting Epstein-Barr nuclear antigen in nasopharyngeal carcinoma cells and normal epithelial cells;
- Androst-4-ENE-3 beta, 17 beta-diol dicyclopentylpropionate combined with traditional Chinese drugs in chronic aplastic anemia;
- Wilson's disease (Hepatolenticular Degeneration)--clinical analysis of 80 cases;
- Long-term results of cerebral hemispherectomy--follow up study of 4 cases with observation of a 22 year survivor;
- Tuberculosis and its control in Beijing;
- A new concept on chiasmal architecture and its projection on the retina;
- In vitro cultivation of M. Leprae.

PB82-136037

(Order as PB82-136029, PC **A05**/MF **A01**)
Chinese Academy of Medical Sciences, Beijing. Capital Hospital.
Clinical Analysis of 120 Cases of Primary Amenorrhea,
Qinsheng Ge, Liyu Huang, Yiwen Zhang, Chunxia Gu, and Yihua Li. Oct 81, 10p
Included in Chinese Medical Jnl., v94 n10 p629-638 1981.

120 primary amenorrhea cases are clinically analyzed and 10 different causes are evaluated. 69.2% are due to congenital causes, congenital ovarian dysgenesis is the most frequent, while pure gonadal dysgenesis the second. Diagnosis for each kind is introduced. Clinical manifestations such as height, secondary sex characteristics, virilism and hirsutism and external and internal genitalia are hints for differentiation of various diagnosis. Management for each kind is discussed.

PB82-136045

(Order as PB82-136029, PC **A05**/MF **A01**)
Guangzhou First People's Hospital (China).
Influence of Late-Pregnancy Toxemia on the Fetus,
Yunfang Wang, and Yanhe Xu. 1981, 6p
Included in Chinese Medical Jnl., v94 n10 p639-644 1981.

Toxemia of late pregnancy greatly influences fetal survival. The fetal mortality rate is 10.71% being 1-5 times above normal. The main causes of fetal death are prematurity, intrauterine anoxia, asphyxia, premature placental separation, hyperplacentalism, etc. Besides the onset and duration of the attack, severity of toxemia has a close relationship with fetal death. The prevention and management are: intensive treatment, use of the placental function test to judge the in utero fetal condition and stressing 5 indications for termination of pregnancy.

PB82-136052

(Order as PB82-136029, PC **A05**/MF **A01**)
Beijing Tropical Medicine Research Inst. (China).
Studies on the Rapid Detection of Dengue Virus Antigen by Immunofluorescence and Radioimmunoassay,
Fuxi Qiu, Haoyan Zhang, Lan Shao, Xuedong Li, and Huirong Luo. 1981, 6p
Prepared in cooperation with National Inst. for Control of Pharmaceutical and Biologic Products, Beijing.
Included in Chinese Medical Jnl., v94 n10 p653-658 1981.

Addition of fluorescein isothiocyanate-labeled or 125I-labeled immune ascitic fluid IgG antibody against Type 4 dengue virus onto brain imprints of newborn mice and coverglass cultures of Aedes albopictus mosquito cell line infected with the prototype strain of Type 4 dengue virus showed specific fluorescence in the cytoplasm which could be inhibited by unlabeled specific antibody or gave a positive result by radioimmunoassay in all of them. Results in all the corresponding uninfected imprints and coverglass cultures were negative. When labeled antibodies were added onto those infected with Type 2 dengue virus or Japanese B encephalitis virus, no positive results were obtained by immunofluorescence or radioimmunoassay. Results by these two methods in a proportion of the head squashes of laboratory-bred female Aedes albopictus mosquitoes which had sucked the blood of mice infected with Type 4 dengue virus were positive, whereas in those mosquitoes which had not sucked the blood of infected mice the results were all negative. Type 4 dengue virus antigen was positive by both methods in a proportion of head squashes and of salivary gland, stomach and ovary squashes of female Aedes albopictus mosquitoes captured from the epidemic region of dengue fever. On the other hand, in those female Aedes albopictus mosquitoes bred in the laboratory in nonepidemic region, the results were all negative.

PB82-136060

(Order as PB82-136029, PC **A05**/MF **A01**)
Chinese Academy of Medical Sciences, Beijing. Capital Hospital.
A New Concept on Chiasmal Architecture and Its Projection on the Retina,
Yuanxiu Lao, Weiye Li, Fengrong Ai, Ruyi Wang, and Yuxia Chen. 1981, 8p
Included in Chinese Medical Jnl., v94 n10 p691-698 1981.

A study of several hundred visual fields of patients with pathologic lesions at the chiasmal region in some temporal fields demonstrates a kind of paracentral hemicircular (PCHC) bundle scotoma which was not connected with the blind spot. The particular pattern of these scotomas prompts the authors to advance a new concept on the chiasmal architecture and its projection on the retina. That is each paracentral fiber bundle on the retina divides into different districts, the fibers from the corresponding districts of each bundle weave compactly into the exact lamella in the chiasma, and with this presumed fiber arrangement, there is the resultant appearance of PCHC bundle scotoma.

PB82-136144 PC **A03**/MF **A01**
SRI International, Menlo Park, CA.
Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Executive Summary.
Research rept.,
Nelda McCall, Thomas Rice, and Bruce Steinhardt. Oct 81, 49p
Contract SSA-600-76-0168
See also Volume 1, PB82-136151. Errata sheet inserted.
Also available in set of 6 reports PC E99, PB82-136136.

The Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment tested two alterations in the Medicare Program: (1) decreasing the copayment rate for outpatient mental health services from 50% to 20%, and (2) recognizing clinical psychologists as independent practitioners. The experiment conducted from October 1976 to December 1978, randomly assigned Medicare beneficiaries to four groups, representing the combinations of experimental and standard benefits. The evaluation had two primary components: (1) assessing the operational aspects of administering the experimental benefits including the processes of selecting qualified psychologists, establishing a quality assurance system, and implementing reimbursement procedures; and, (2) determining their impact on the use, cost, and delivery of mental health and medical services reimbursed under Medicare in terms of the number of beneficiaries using mental health services, the intensity and cost of mental and medical service use, substitution of mental health services for nonmental-health medical services, provider billing and treatment patterns, substitution of outpatient mental health services for inpatient services and the distribution of providers. The report also provides analyses of beneficiaries 'and providers' characteristics and attitudes and the relationship between use and cost of mental and medical services.

PB82-136151 PC **A05**/MF **A01**
SRI International, Menlo Park, CA.
Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume I: Description of the Experiment.
Final rept.,
Nelda McCall. May 81, 80p
Contract SSA-600-76-0168
See also PB82-136144, and Volume 2, PB82-136169. Also available in set of 6 reports PC E99, PB82-136136.

The Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment tested two alterations in the Medicare Program: (1) decreasing the copayment rate for outpatient mental health services from 50% to 20%, and (2) recognizing clinical psychologists as independent practitioners. The experiment conducted from October 1976 to December 1978, randomly assigned Medicare Beneficiaries to four groups, representing the combinations of experimental and standard benefits. Volume I describes the experiment and the evaluation, reviews previous research on the experimental issues and identifies the data sources for the evaluation.

PB82-136169 PC **A09**/MF **A01**
SRI International, Menlo Park, CA.
Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume II: Process Evaluation.
Final rept.,
Nelda McCall, Thomas Rice, and Michelle Swenson. May 81, 177p
Contract SSA-600-76-0168
See also Volume 1, PB82-136151, and Volume 3, PB82-136177.
Also available in set of 6 reports PC E99, PB82-136136.

The Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment tested two alterations in the Medicare Program: (1) decreasing the copayment rate for outpatient mental health services from 50% to 20%, and (2) recognizing clinical psychologists as independent practitioners. The experiment conducted from October 1976 to December 1978, randomly assigned Medicare beneficiaries to four groups, representing the combinations of experimental and standard benefits. Volume II focuses on four processes intrinsic direct reimbursement to psychologists: setting qualifications for those allowed to practice autonomously, monitoring their services, developing definitions of services to be covered, and developing reimbursement levels.

PB82-136177 PC **A04**/MF **A01**
SRI International, Menlo Park, CA.
Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume III: Provider Questionnaire.
Final rept.,
Nelda McCall. May 81, 59p
Contract SSA-600-76-0168
See also Volume 2, PB82-136169, and Volume 4, PB82-136185.
Also available in set of 6 reports PC E99, PB82-136136.

The Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment tested two alterations in the Medicare Program: (1) decreasing the copayment rate for outpatient mental health services from 50% to 20%, and (2) recognizing clinical psychologist as independent practitioners. The experiment conducted from October 1976 to December 1978, randomly assigned Medicare Beneficiaries to four groups, representing the combinations of experimental and standard benefits. Volume III presents data on practice and practitioner characteristics, knowledge of the experiment, and attitudes towards non-physician practitioners obtained from a survey questionnaire mailed in January 1978 to psychologists and psychiatrists practicing in Colorado.

PB82-136185 PC **A11**/MF **A01**
SRI International, Menlo Park, CA.
Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume IV: Beneficiary Survey.
Final rept.,
Nelda McCall, Hoi S. Wai, and Michelle Swenson. May 81, 234p
Contract SSA-600-76-0168
See also Volume 3, PB82-136177, and Volume 5, PB82-136193.
Also available in set of 6 reports PC E99, PB82-136136.

The Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment tested two alterations in the Medicare Program: (1) decreasing the copayment rate for outpatient mental health services from 50% to 20%, and (2) recognizing clinical psychologists as independent practitioners. The experiment conducted from October 1976 to December 1978, randomly as-

signed Medicare beneficiaries to four groups, representing the combinations of experimental and standard benefits. Volume IV presents and analyzes data on beneficiary demographic characteristics, perceived health status and need for mental health services, supplemental health insurance coverage, medical expenditures, and preferences for Medicare benefit expansions obtained from survey of Medicare beneficiaries conducted in Colorado in early 1979.

PB82-136193 PC **A08**/MF **A01**
SRI International, Menlo Park, CA.
Evaluation of the Colorado Clincial Psychology/ Expanded Mental Health Benefits Experiment. Volume V: Impact of the Experiment on the Use, Cost, and Delivery of Medicare Services.
Final rept.,
Nelda McCall, Stanley Parker, and Thomas Rice.
May 81, 160p
Contract SSA-600-76-0168
See also Volume 4, PB82-136185.
Also available in set of 6 reports PC E99, PB82-136136.

The Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment tested two alterations in the Medicare Program: (1) decreasing the copayment rate for outpatient mental health services from 50% to 20%, and (2) recognizing clinical psychologists as independent practitioners. The experiment conducted from October 1976 to December 1978, randomly assigned Medicare beneficiaries to four groups, representing the combinations of experimental and standard benefits. Volume V analyzes the effect of the experiment on the use, cost, and delivery of medical and mental health services.

PB82-136920 PC **A04**/MF **A01**
Veterans Administration Medical Center, Little Rock, AR.
Evaluation of the Program of Nursing Services,
Christine Boren, and Marjorie C. Poole. Apr 81, 75p
VA/NPR-149

This retrospective study was conducted at Veterans Administration (VA) Medical Center, Little Rock, Arkansas, to generate a profile of the NHCU veteran population, determine a baseline of nursing services for future program planning and allocation of resources, and identify sources for nursing studies and research. Information was collected by interview and questionnaire and from a wide variety of reporting mechanisms, and administrative documents. Results indicated that the NHCU is largely accomplishing its goal for providing basic nursing services, and quality of life. Skilled nursing services of a rehabilitative and teaching nature, and therapeutic programs require greater achievement and additional resources. Opportunity for research exists at all levels of geriatric clinical practice, especially in the realm of behavior management. It includes a bibliography.

PB82-137860 PC **A05**/MF **A01**
Washington Univ., St. Louis, MO. School of Medicine.
Effects of Exercise Training on Lipid and Carbohydrate Metabolism in Hemodialysis Patients.
Annual rept. 1 Oct 80-30 Sep 81,
Andrew P. Goldberg. 20 Oct 81, 89p AK-1-9-2221-81
Contract N01-AM-9-2221
See also report for 1 Oct 79-30 Sep 80, PB81-221525.

A longitudinal study is in progress in 29 hemodialysis patients to determine the effects of exercise training on their lipid and carbohydrate metabolism, blood pressure control, work capacity, cardiovascular function, anemia, bone-mineral metabolism and phychological function. Patients were randomly assigned to an immediate exercise group (n=22) or a no-exercise control group (n=7). Baseline evaluations excluded patients in whom exercise was contraindicated. Initial treadmill test (GXT) durations and VO2 max levels were 30-50% below normal, and 15 patients had a positive GXT. All patients received dietary assessments and instruction. Exercise training increased GXT duration by (17.3%, $p<.005$) and VO2 max (18.6%, $p>.025$). There were reductions in plasma triglyceride (-15%, $p<.05$), increases in high density lipoprotein cholesterol (+15%, $p<.01$) and improvements in glucose tolerance and insulin receptor affinity. These metabolic parameters did not change in the no-exercise controls. Blood pressures decreased in the hypertensive patients. Increases in hematocrits ($p<.01$) and hemoglobin concentrations ($p<.01$) occurred in 6 men. Red cell survival normalized in the 2 patients who were studied. Reductions in serum phosphate, parathyroid hormone and alkaline phosphatase levels were observed in the most vigorously trained patients. Exercising patients also had improvements in depression, mood and social adjustment. Thus, vigorous exercise training seems to improve abnormalities in lipid and glucose metabolism and hematologic function, reduce blood pressure, benefit bone-mineral metabolism and improve psychological function in patients with endstage renal disease requiring hemodialysis.

PB82-137951
(Order as PB82-137936, PC **A23**/MF **A01**)
Harvard Medical School, Boston, MA.
The Non-Invasive Evaluation of the Coronary Artery Disease Patient: Clinical, Economic, and Social Issues,
Alfred F. Parisi. 1981, 29p
Sponsored in part by National Center for Health Services Research, Hyattsville, MD.
Included in Proceedings of Coronary Artery Bypass Surgery, p50-77, Nov 81.

Potential candidates for coronary artery bypass surgery (CABS) see a cardiologist for one of several reasons, including chest pain, recent myocardial infarction, a 'positive' stress test (usually an exercise electrocardiogram), and anticipation of another extensive (usually vascular) surgical procedure. In the largest subgroup, patients symptomatic from chest pain, the history and physical examination are the key elements in determining the extent and direction of subsequent testing and the possibility of medical intervention, surgical intervention, or both.

PB82-138124 PC **A12**/MF **A01**
Lewin and Associates, Inc., Washington, DC.
Differential Reimbursement of Hospitals.
Final rept.
Sep 81, 261p
Contract HCFA-600-77-0073

The objective of this study was the development of a methodology to determine the appropriate level of differential, if any, in reimbursement to short term hospitals by different payers. The study was performed in 15 hospitals, five in each of three states. The hospitals differed in size, complexity, ownership and location. The sample was not selected to be representative of different hospital types in the United States and the results were not weighted to project the results on that distribution of hospitals. The major analytical tasks performed under this contract included identification of: The extent of differences in the intensity of nursing time by third-party payer; the extent to which third-party payers consume different levels of resources in hospital business functions; the extent to which practices both of hospitals and of third-party payers affect cash flow to hospitals; the effect of various patterns of insurance coverage on patient responsibility, bad debts and charity care; and the extent to which a particular reimbursement methodology can determine reimbursement due a hospital from a third-party payer.

PB82-139908 PC **A06**/MF **A01**
Urban Inst., Washington, DC.
Medicaid Nursing Home Reimbursement in Minnesota (Volume 3),
Bruce Spitz, and Jane Weeks. 27 Sep 79, 105p 1216-5
Contract HCFA-600-77-0070

This report examines the politics and economics of Medicaid nursing home reimbursement in the State of Minnesota. It traces the development of the rate setting mechanism, identifies political trends and considerations among the principal actors, and analyzes the economic incentives in the reimbursement system adopted by the State in 1977. The Minnesota reimbursement system is the product of strong legislative intervention and extensive regulatory and legislative detail. The legislative involvement was a result of the industry's lobbying for reimbursement policy changes which the executive branch was unwilling to grant and, to some extent, the notoriety surrounding the River Villa nursing home expose.

PB82-139916 PC **A05**/MF **A01**
Urban Inst., Washington, DC.
Medicaid Nursing Home Reimbursement in Connecticut (Volume 6),
Bruce Spitz, and Jane Weeks. Sep 79, 90p 1216-2
Contract HCFA-600-77-0070

This report examines the politics and economics of Medicaid nursing home reimbursement in the State of Connecticut. It traces the development of the rate setting mechanism, identifies political trends and considerations among the principal actors, and analyzes the economic incentives in the reimbursement system adopted by the State in 1976. The study found that two factors influenced the way Connecticut formulated Medicaid reimbursement policy. These were: (1) the perceived Federal legislative commitment to assure that States reimburse on a cost related basis and (2) the widely publicized New York nursing home scandals. The Moreland Act Commission Report, which was a result of an investigation of these scandals, served as a guide for the studies conducted in Connecticut. In addition, the Moreland report provided a prototype for the State's capital reimbursement methodology.

PB82-139924 PC **A04**/MF **A01**
Urban Inst., Washington, DC.
Medicaid Nursing Home Reimbursement in Colorado (Volume 7),
Jane Weeks, and Bruce Spits. Sep 79, 65p 1216-1
Contract HCFA-600-77-0070

This report examines the politics and economics of Medicaid nursing home reimbursement in the State of Colorado. It traces the development of the rate setting mechanism, identifies political trends and considerations among the principal actors, and analyzes the economic incentives in the reimbursement system adopted by the State in 1966 and used by Medicaid since the beginning of the program. Colorado's reimbursement policy has remained remarkably stable since a cost related system was implemented by the Department of Social Services. Three factors have contributed to this stability: (1) the continuity among a small group of critical actors; (2) the easily understood system design that permitted providers an adequate return while preventing excessive profits; and, (3) until recently, a virtual absence of nursing home scandal.

PB82-139932 PC **A03**/MF **A01**
Urban Inst., Washington, DC.
Medicaid Nursing Home Reimbursement in Louisiana (Volume 8),
Jane Weeks, and Bruce Spitz. Apr 78, 29p 1216-00
Contract HCFA-600-77-0070

This report examines the politics and economics of Medicaid nursing home reimbursement in the State of Louisiana. It traces the development of the rate setting mechanism, identifies political trends and considerations among the principal actors, and analyzes the economic incentives in a reimbursement system which has not changed since the enactment of Medicaid. The dominant force shaping Louisiana's reimbursement policy is the State's desire to hold down costs by maintaining strict control over program expenditures. The low income level of the State's residents result in revenues which simply cannot support expansive programs. In order to project expenditures, the State employed a negotiated flat rate nursing home reimbursement system since the beginning of the program. At the time of the study, the State was developing a simple cost related reimbursement system as required by Federal regulations.

PB82-140450 PC **A04**/MF **A01**
Nationale Raad voor Landbouwkundig Onderzoek TNO, The Hague (Netherlands).
Biotechnology in Agricultural Research (Biotechnologie in het Landbouwkundig Onderzoek).
Study rept. no. 9.
c1981, 75p
Text in Dutch.

In view of the great efforts made in the United States and Japan in the area of bio-bulkprocesses and enzymatic hydrolyses with single enzyme systems there appear to be opportunities for Holland to come up with innovations in 'fine' biotechnology and the rather trying systems. This report which treats the subject deals with the integration of one or more biologic disciplines and processing technologies leading to an improved (or new) production process in which live materials, or materials from a live source, are input into a biochemical reaction process. The report lists the biotechnological activities of the various Dutch agriculturally related organizations, institutes and research centers and the interaction of all the agricultural sciences (the circle of disciplines) with the application sciences (the circle of applications). Seven areas have been selected as having especially important potential for results in this field: Plant cell and tissue growth, Dairy biotech-

nology, Carbon hydrate biotechnology, Energy related biotechnological research, Biotechnological production of bioinsecticides, Exploitation of animal cells and potentials in vitro biogenetic syntheses and biomimetics.

PB82-141300 PC **A99**/MF **E04**
Public Health Service, Rockville, MD. Office on Smoking and Health.
Smoking and Health, A Report of the Surgeon General.
11 Jan 79, 1202p DHEW/PUB/PHS-79-50066

This volume updates and greatly expands the current knowledge about all aspects of smoking and health first published in 1964 by the Surgeon General's Advisory Committee on Smoking and Health. Three major areas are critically reviewed and assessed: the health consequences of smoking; behavioral aspects of smoking; and educational and prevention aspects of smoking and tobacco use. Over 3,300 references are cited in this 1,200 page report updating information linking smoking to many major disease areas including the following: overall mortality and morbidity, heart disease, cancer, chronic obstructive lung disease, and outcomes of pregnancy. In addition the report covers such areas as peptic ulcer disease, interactive effects of smoking and occupation, involuntary smoking, smoking and allergy and immunity, constituents of tobacco and tobacco smoke, and the effects of smoking on drugs, food constituents and diagnostic tests. The section on behavior discusses biological as well as behavioral influences on initiation, maintenance and cessation of smoking and the psychosocial determinants of smoking behavior in children and adolescents. An appendix on smoking behavior trends in the United States from 1950 to 1978 is presented. A complete subject index to all major topics in the Report is also included.

PB82-141326 PC **A07**/MF **A01**
Association of American Colleges, Washington, DC.
An Evaluation of the National Heart, Lung and Blood Institute's Pulmonary Academic Award Program.
Final rept. 1 Sep 80-30 Nov 81,
Charles R. Sherman. 30 Nov 81, 133p
Contract N01-HR-0-2907

A decade ago there were few strong academic programs in pulmonary medicine in the United States. A number of major discoveries about the respiratory, circulatory and other body systems opened strongly promising avenues of research into causes and cure of pulmonary disease. There were clearly perceived needs to integrate the disciplines that treat the lung, to build upon the new pulmonary knowledge base, to translate the growing knowledge into improved health care techniques, and to assure that new physicians are educated in modern pulmonary medicine. Recognizing these needs and shortages, the Division of Lung Diseases at the National Heart, Lung and Blood Institute, as part of its manpower development program, established the Pulmonary Academic Award Program (PAA) to stimulate the development of pulmonary academicians and to improve pulmonary curricula.

PB82-802356 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Mental Health Services: Personal Health Care. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 225p
Supersedes PB80-813611, and NTIS/PS-79/0807.

A compilation of abstracts are presented on mental health services for direct patient care and maintenance. Topics included are inpatient services, nursing home services, ambulatory services, home health services, emergency services, and community services. Services encompass those for alcohol and drug abuse, mental problems of the elderly, mental retardation, and other mental problems of the population. (This updated bibliography contains 218 citations, 8 of which are new entries to the previous edition.)

PB82-802612 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Self Care. March, 1972-November, 1981 (Citations from the NTIS Data Base).
Rept. for Mar 72-Nov 81.
Dec 81, 64p
Supersedes PB80-813983, and NTIS/PS-79/0864.

The bibliography contains citations that discuss the lay person becoming involved in his own health promotion and prevention. Disease detection and treatment are also covered. (This updated bibliography contains 57 citations, 12 of which are new entries to the previous edition.)

PB82-802638 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Immunologic Diseases. 1975-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1975-Nov 81.
Dec 81, 183p
Supersedes PB80-813900, and NTIS/PS-79/0896. See also 1964-74, NTIS/PS-75/579.

The bibliography cites research on diseases resulting from immunodeficiency, autoimmunity, and allergic responses. The pathologic mechanisms of autoimmunity and hypersensitivity are discussed. Reports on allergenic extracts for diagnostic purposes are also included. (This updated bibliography contains 175 citations, 20 of which are new entries to the previous edition.)

PB82-802927 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Terminal Care. 1969-November, 1981 (Citations from the NTIS Data Base).
Dec 81, 151p
Supersedes PB80-814106, and NTIS/PS-79/0889.

The selected references cover the following topics: Needs and care of dying patients and their families; psychological and social aspects of death as related to the patient dying at home or the hospital; the concept of hospice care and characteristics of hospices; the issue of euthanasia, and education for personnel caring for the dying patient. (This updated bibliography contains 43 citations, 22 of which are new entries to the previous edition.)

PB82-859216 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Preventive Medicine: Hazardous Materials Exposure and Public Health. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 202p
Supersedes PB81-854838. Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography covers medical criteria, measures, and procedures for preventing or protecting human populations from health hazards or risks due to casual, therapeutic, or occupational exposure to hazardous materials and toxic substances in natural, medical, and industrial environments. The energy and health care industries are emphasized. (This updated bibliography contains 183 citations, 49 of which are new entries to the previous edition.)

PB82-859323 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Malnutrition: Immunological Aspects. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for Jan 78-Dec 81.
Dec 81, 174p

This bibliography contains citations concerning the effect of prenatal and postnatal protein malnutrition on immune response. Both human and animal studies are examined. Immunological maturation, humoral and cell-mediated immune response, defects in phagocytic function, and reduced complement activity are discussed. The long term effects of protein malnutrition on immune response are also considered. (Contains 169 citations fully indexed and including a title list.)

PB82-859588 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Colostrum: Immunological Aspects. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for Jan 78-Dec 81.
Dec 81, 202p
Supersedes PB81-856452.

This bibliography contains citations concerning the transmission of passive immunity to neonates by colostrum. Discussion includes factors relating to absorption rate, the duration of the antibodies, the role of T-lymphocytes and other leukocytes and interferon activity. Assay methods are also discussed. (This updated bibliography contains 187 citations, 55 of which are new entries to the previous edition.)

PB82-859943 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Fetal Alcohol Syndrome. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for Jan 78-Dec 81.
Dec 81, 58p

This bibliography contains citations concerning maternal alcohol abuse during pregnancy and the development of fetal alcohol syndrome. Viability, birth weight, growth and mental retardation, neurological dysfunction, and congenital defects are discussed. Animal models are considered. (Contains 63 citations fully indexed and including a title list.)

PB82-859968 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Effects of Hyperthermia and Radiation. 1978-1981 (Citations from the Energy Data Base).
Rept. for Jan 78-Dec 81.
Dec 81, 142p
Supersedes PB81-860538. Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning the effects of hyperthermia alone and in combination with radiation. The effects of pH on hyperthermia and radiation, the synergistic effect on hyperthermia and radiation, and the effect of sequence on host response are considered. Dose response relationships, temperature, and time dependence are also included. Many citations concern cancer therapy (This updated bibliography contains 121 citations, 25 of which are new entries to the previous edition.)

6F. Environmental Biology

AD-A106 884/0 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Coal and Nuclear Wastes--Both Potential Contributors to Environmental and Health Problems.
21 Sep 81, 26p Rept no. GAO/EMD-81-132

The literature confirmed that wastes produced by both fuel cycles present the potential for significant environmental and health hazards. Although coal has been used considerably longer than nuclear, its environmental and health effects are not as fully understood. In fact, coal wastes were not even recognized as potentially hazardous until recent years. Thus, little information has been compiled to measure or evaluate coal waste risks. Nuclear wastes, on the other hand, were always considered potentially harmful because of their recognized radioactivity and the perceived consequences of an accident. Because of this, the possible environmental and health effects of all nuclear wastes have been carefully studied, evaluated, and documented by both the Federal Government and the nuclear industry. The biggest uncertainty with nuclear wastes is the lack of a demonstrated solution to the permanent isolation of high-level waste or spent reactor fuel. Since coal and nuclear wastes present different types of hazards and the information available on these wastes is not comparable, we did not believe it was possible to determine if either waste type is more of a hazard than the other. Nonetheless, several comparisons of the waste amounts, potential hazards, and past environmental and health effects resulting from each respective fuel cycle can be made that provide a perspective on the individual hazards of each waste type. (Author)

AD-A107 276/8 PC **A08**/MF **A01**
National Fishery Research Lab., La Crosse, WI.

Biological Activity and Chemical Characteristics of Dredge Material from 10 Sites on the Upper Mississippi River,
Leif L. Marking, Verdel K. Dawson, John L. Allen, Terry D. Bills, and Jeff J. Rach. Oct 81, 152p

The U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (COE) are responsible for developing guidelines to regulate the disposal of dredged material. Many governmental and private interest groups in the Mississippi River basin are concerned about potential hazards associated with the possible release of contaminant substances during dredging activities and the deleterious effects that resuspended materials may have on aquatic organisms. This study was conducted to determine the biological activity and chemical characteristics of dredge material from 10 sites in the Upper Mississippi River between St. Paul and Winona, Minnesota. Funds for the study were provided by the St. Paul District of COE.

AD-A107 458/2 PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Dept. of Entomology.
A New Approach for the Control of Cockroaches Utilizing the Entomophilic Nematode DD-136 in Conjunction with Attractants.
Annual rept. no. 1,
G. Mallory Boush. Oct 81, 23p
Contract N00014-80-C-0080

The broad overall objective of this project is to develop a successful pest management scheme to control cockroaches on board naval ships and on shore facilities, based on the use of promising entomophilic nematodes in conjunction with baits, attractants and harborage-inoculation devices. In addition, four juvenile hormone analogs were evaluated for possible use in controlling cockroaches on naval ships and shore facilities. The entomophilic nematode, Neoaplectana carpocapsae=DD-136, and associated bacterium, Xenorhabdus nematophilus have been tested in the laboratory as far as potential and capacity to infect and kill the German cockroach, Blattella germanica.

DE82000154 PC **A07**/MF **A01**
Argonne National Lab., IL.
Radiological and Environmental Research Division Annual Report, January-December 1980: Ecology.
Jul 81, 131p ANL-80-115-Pt.3
Contract W-31-109-ENG-38

Separate abstracts were prepared for individual reports of research programs. (ERA citation 06:035502)

LA-8217-PR PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Water Quality in the Vicinity of Fenton Hill Site, 1978. Progress Report.
W. D. Purtymun, R. W. Ferenbaugh, A. K. Stoker, W. H. Adams, and J. W. Owens. Jan 80, 22p
Contract W-7405-ENG-36

Water quality data have been collected from surface and ground water stations and from ponds at the Fenton Hill Site located in the Jemez Mountains, as part of a continuing program of environmental studies. There have been slight variations in the chemical quality at individual stations; however, these variations in water quality are within normal seasonal fluctuations. Evaluation of the aquifer furnishing water to the Fenton Hill Site indicates a transmissivity of about 1200 m exp 2 /day. The specific capacity over a five day test was 28 l/s/m of drawdown. There was a slight increase in total dissolved solids in the well water between 1977 and 1978. Water quality and soluble fluoride and chloride in sediments in the canyon that receives excess water from the ponds indicate that these constituents decrease to background within 300 m of the ponds. A water balance of amount produced at the site indicates 7% of the water lost to evaporation from the ponds, 31% lost by infiltration into tuff beneath the ponds, 21% of the water discharged from the ponds, and 41% used for downhole experiments, drilling operations, and general site use. (ERA citation 05:016692)

PB82-127358 PC **A03**/MF **A01**
Environmental Research Lab.-Duluth, MN.
Effects of Pollution on Freshwater Fish.
Journal article,
R. L. Spehar, A. E. Lemke, Q. H. Pickering,, T. H. Roush, and R. C. Russo. Oct 81, 49p EPA-600/J-81-347
Pub. in Jnl. of Water Pollution Control Fed., v53 n6 p1028-1076 1981.

A review of the 1981 world literature was conducted on the effects of pollution on freshwater fish. This review contained 376 references and included papers on water quality such as dissolved gases and pH; chemical pollutants such as insecticides, herbicides, piscicides and anesthetics; inorganics, organics and industrial and municipal effluents including chlorine and wastewater and pulp and paper. Papers from reviews and symposia and those dealing with physical factors were also included. Within the above sections, papers were organized into general articles, surveys, toxicology, bioaccumulation, physiology and behavior.

PB82-128117 PC **A02**/MF **A01**
Environmental Research Lab.-Duluth, MN.
Effects of Acid Precipitation in North America.
Journal article,
N. R. Glass, G. E. Glass, and P. J. Rennie. Oct 81, 10p EPA-600/J-81-348
Pub. in Environmental International, v4 p443-452 1980.

Recent evidence indicates that acid rain is a growing environmental phenomenon of potentially far reaching consequences and increasing geographical extent in North America. Acid rain is but one aspect of the broader problem of atmospheric deposition which includes snow, fog, and dry deposition of material. First noticed and studied in the Scandinavian countries, acid precipitation has now been well documented in the United States, first in the Northeast and now more recently throughout much of the United States east of the Mississippi River. Numerous streams and lakes in regions with poorly buffered soils have become devoid of fish, have an impoverished aquatic flora and fauna, and are changing toward conditions of low aquatic productivity. Evidence also indicates that acid precipitation may cause damage to forest growth, crop production, and man-made materials such as buildings, metals, paints, and statuary.

PB82-128174 PC **A03**/MF **A01**
Environmental Research Lab., Gulf Breeze, FL.
Marine and Estuarine Pollution.
Journal article,
D. J. Reish, P. S. Oshida, F. G. Wilkes, A. J. Mearns, and S. S. Rossi. Nov 81, 28p EPA-600/J-81-069
Pub. in Jnl. of Water Pollution Control Fed., p925-949 Jun 81. Prepared in cooperation with California State Univ., Long Beach; Southern California Coastal Wastes, Long Beach; National Oceanic and Atmospheric Administration, Seattle, WA. and Scripps Institution of Oceanography, La Jolla, CA.

This literature review summarizes current data on the effects of pesticides and trace contaminants on marine and estuarine organisms. Impacts of the petroleum industry on marine ecosystems is reviewed from several viewpoints including world input to the oceans and French coast, biotransformation, oil spill technology, hydrocarbon characterization, toxicity, blowouts, and liability.

PB82-128190 PC **A02**/MF **A01**
Environmental Research Lab., Gulf Breeze, FL.
Influence of Drilling Muds on the Primary Chemosensory Neurons in Walking Legs of the Lobster, 'Homarus americanus'.
Journal article,
Charles D. Derby, and Jelle Atema. Nov 81, 11p EPA-600/J-81-128
Grant EPA-R-806630010
Pub. in Canadian Jnl. of Fisheries and Aquatic Sciences, v38 n3 p268-274 1981.

The effects of whole drilling muds on the normal activity of walking leg chemosensory neurons were examined using extracellular neurophysiological recording techniques. Exposure of legs for 3-5 min to 10-mg/L drilling mud suspended in sea water altered responses to food odors of 29% of the chemoreceptors examined (data polled for the two drilling muds tested); similar exposure to 100-mg/L drilling mud resulted in interference with 44% of all receptors studies. The effects of both of these concentrations are statistically significant, although they are not different from each other. Interference was usually manifested as a marked reduction in the number of action potentials in a response. In one preparation, the exposure to drilling mud caused a change in the temporal pattern of the spikes without affecting the total number of spikes. Other chemosensory neurons were excited by 10-mg/L drilling mud itself. However, not all chemoreceptors are affected by these drilling muds since responses to feeding stimuli were recorded from the legs of lobsters that had been exposed to drilling mud for 4-8 d before the neurophysiological experiments.

PB82-131293 PC **A07**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Pesticides and Toxic Substances.
Pesticide Registration Standard: Isopropalin.
Aug 81, 148p EPA-540/RS-81-009

This document contains information regarding reregistration of pesticide products containing Isopropalin, including how to register under the registration standard, regulatory position and rationale, and summaries of data requirements and data gaps. Also included is a bibliography containing citations of all studies reviewed by EPA in arriving at the positions and conclusions contained in the standard.

PB82-135971 PC **A07**/MF **A01**
Environmental Resources Management, Inc., West Chester, PA.
Oxygen Dynamics Study - Susquehanna River Below Conowingo Dam, Maryland: Volume I.
Interim rept.,
Kurt R. Philipp, Michael P. Evans, Thomas D. Johnson, and George T. Potera. Dec 80, 135p
PPSP/UBLS-80-3
See also PB82-135963.

This interim report presents oxygen dynamics data and the results for field studies conducted at and below Conowingo Dam on the Lower Susquehanna River. The study period covered by this report is May through July, 1980. The first objective of the oxygen dynamic study was to determine the effects of various processes on dissolved oxygen dynamics below Conowingo Dam. The second objective was to relate dissolved oxygen regimes with fish distribution and the quality of aquatic habitat.

PB82-137621 PC **A02**/MF **A01**
Nevada Univ., Las Vegas. Dept. of Biological Sciences.
Use of Aquatic Oligochaete, 'Lumbriculus variegatus', for Effluent Biomonitoring.
Industrial environmental research brief,
C. Evan Hornig. Dec 80, 11p EPA-600/D-80-005
Contract EPA-68-03-2619

The report describes a simple, inexpensive static bioassay technique using the aquatic oligchaete (earthworm), Lumbriculus variegatus (Muller), to screen cooling-water effluents for environmental toxicity. (Biological approaches to the early detection of toxic agents in industrial effluents and receiving waters generally require complex techniques and equipment, and are often impractical for use in self-monitoring programs or large-scale monitoring networks.) The new method requires only the test organism, holding containers, and temperature control. The test organisms are readily available, require little preparation and maintenance, and are sensitive to a variety of toxicants. Study findings demonstrate the organism's sensitivity to the widely used biocide, sodium pentachlorophenate (96-hour LC50 of 0.57 ppm), and to actual industrial wastes. While further refinement and testing will be required, this simple bioassay appears to hold considerable promise for cost-efficient pre-screening of toxic changes in cooling-water effluents.

PB82-139437 PC **A06**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Pesticides and Toxic Substances.
Naphthalene: Pesticide Registration Standard.
Sep 81, 105p

This document contains information regarding reregistration of pesticide products containing naphthalene including how to register under a registration standard, regulatory position and rationale, and summaries of data requirements and data gaps. Also included is a bibliography containing citations of all studies reviewed by EPA in arriving at the positions and conclusions contained in the Standard.

PB82-144619 PC **A09**/MF **A01**
Systems Management Associates, Inc., Virginia Beach, VA.
Evaluation of Formaldehyde Problems in Residential Mobile Homes.
Final rept.,

Robert Stone, Ben Tucker, Diane DePaso, Edward Shepard, and Emilia Villarreal. Mar 81, 195p HUD-0002070
Contract HUD-H-5105

The magnitude of the formaldehyde problem inside residential mobile homes was examined, and a computer model was developed to help HUD evaluate potential regulatory alternatives specifying maximum formaldehyde levels for new mobile homes. Cost - benefit analysis was the main tool used to evaluate the regulatory alternatives, and it included a range of assumptions and determination of the sensitivity of the cost - benefit results to these different scenarios. Previous mobile home formaldehyde research conducted in Wisconsin, Washington, and Minnesota showed that the number of reported formaldehyde problems in all three states is strongly and negatively correlated with the ages of the mobile homes. A computer model was used to establish the relationship between levels of formaldehyde inside the home and the number of occupants affected by formaldehyde outgassing. Health costs associated with formaldehyde exposure were then examined to establish the baseline costs incurred by mobile home occupants in the absense of regulation. Effects of setting initial limits of 0.1, 0.2, 0.3, and 0.4 parts formaldehyde per million were then examined and compared with the effects of no regulation. Results indicated that the optimal regulatory level could range anywhere from no regulation to a limit of 0.4 parts per million, depending on how extensive the underreporting of formaldehyde problems really is and on the average initial level of formaldehyde currently in new mobile homes. Given the uncertainty regarding the actual values of these important variables, it is impossible to rank the five regulatory alternatives with any degree of confidence. Further research is needed to increase existing knowledge about the level of formaldehyde outgassing in mobile homes and about the frequency and severity of attendant health effects. Field tests in a random sample of U.S. mobile homes are urgently needed. Information is also needed about the costs and effectiveness of the various formaldehyde abatement techniques. Figures, tables, footnotes, and appendices presenting the computer model, analysis of formaldehyde abatement technologies, an injury cost model and an analysis of survey data are presented.

PB82-858895 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Radioecology. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 182p
Supersedes PB81-858862. Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning the effects of radiation on food chains, aquatic ecosystems and terrestrial ecosystems. Methodology for the assessment of radiation hazards in the environment, and measurement of radiation exposure are included. (This updated bibliography contains 162 citations, 28 of which are new entries to the previous edition.)

6H. Food

AD-A106 829/5 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Efforts to Improve School Lunch Programs--Are They Paying Off.
9 Sep 81, 89p Rept no. GAO/CED-81-121
Report to the Congress.

This report discusses the difficulty in meeting the Department of Agriculture's nutrient goals for school lunches even when meal portions served meet or exceed the requirements of the meal pattern. The report also discusses various methods some school districts are using to serve more nutritious school lunches as well as increase student participation and reduce food waste and program costs. (Author)

AD-A106 892/3 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Storage Cost Data on CCC-Owned Dairy Commodities.
18 Sep 81, 8p Rept no. GAO/CED-81-157

As of June 30, 1981, the Corporation's dairy inventories consisted of about 518 million pounds of butter, about 486 million pounds of cheese, and about 871 million pounds of nonfat dry milk. Nearly three-fourths of the dairy products in storage are less than 1 year old. The Government's cost to store dairy products has risen sharply, totaling over $24 million for the first 9 months of fiscal year 1981. By comparison, storage costs for fiscal years 1977-80, when inventories were at lower levels, averaged about $11 million annually. Relatively small quantities of these products are lost due to spoilage while in storage. However, some loss in quality or product deterioration can occur, and when it does, the products are sold at less than inventory value. Only the nonfat dry milk is sold on a restricted basis (not to be used for human consumption). (Author)

AD-A107 307/1 PC **A04**/MF **A01**
Army Natick Research and Development Labs., MA.
USAF Food Habits Study. Part IV. Selections, Quantities Selected, and Perceived Portion Sizes.
Technical rept.,
Kerry W. Wyant, and Herbert L. Meiselman. Jul 80, 62p Rept no. NATICK/TR-81/025
See also Part 3, AD-A101 020

This report presents results of the 3rd of 3 data collection efforts undertaken at Travis AFB to provide information describing the food habits of AF personnel. The report focuses on food selections, quantities of food selected, and perceptions of the sizes of food portions as they are made available. The Food Selection Questionnaire was modified for the present study to allow the respondent to report having selected as many as three servings of a food, and to allow the respondent to indicate his perception of serving sizes. It was administered during two breakfast meals and four noon meals. Food selections of whites and blacks and males and females for certain food items tended to be consistent with 1977 food preference data, and the number of servings of food selected tended to be related to the perceived portion size as well as to the 1977 food preference data. Perceived portion size tended to be inversely related to the food preferences. In all instances, correlations were most meaningful for foods preferred by whites. Whole milk, tacos, grilled bacon, and carbonated beverages were among the most frequently selected foods. Based on self-reported weights and the Metropolitan Life Tables, half of the males were overweight (OW) while the majority of white females were average weight (AW). When the weight tables were adjusted for clothing, the majority of the personnel sampled were OW. In contrast to the AW who attended the dining halls, the OW tended to select high-density, saturated fatty foods. Results based on 1977 food diaries indicated that the OW tended to eat a greater number of breakfasts across a three-day period than did lighter respondents.

AD-A107 335/2 PC **A03**/MF **A01**
Defense Intelligence Agency, Washington, DC. Directorate for Scientific and Technical Intelligence.
Nutrition Research--USSR,
Victoria Dibbern. 30 Oct 81, 43p Rept no. DIA-DST-1810S-144-81

This report reviews selected Soviet nutrition research having military significance in terms of meeting nutritional requirements in typical military environments, as well as in adverse natural environments in which military forces operate. Addressed are nutritional requirements in cold and hot environments and at high altitudes, as well as nutritional requirements with physiological and psychological stresses caused by such factors as noise, decompression, flight, toxic environments, and mental and physical work. Therapeutic and prophylactic uses of various nutrients are also reviewed, particularly in relation to a specific kind of stress. Also included in this report is an overview of Soviet nutrition--its organization, history, leading institutes and personalities, and important areas of research. The last section comprises an assessment, not only of the research reviewed for this report, but of Soviet nutrition research in general. This is based on the author's monitoring of the Soviet nutrition literature over the past 10 years, as well as on assessments made by others who have either visited the USSR or have made a considerable effort to become knowledgeable about Soviet nutrition research. This study is an intelligence community initiative performed under the Defense Intelligence Agency task, Selected Topics in Biological Sciences.

BSDF-38-3Q-80 PC **A05**/MF **A01**
Beet Sugar Development Foundation, Fort Collins, CO.
Evaporation by Mechanical Vapor Recompression. Technical Progress Report, April 1, 1980-June 30, 1980.
C. H. Iverson, and G. E. Coury. 1980, 81p
Contract AC03-79CS40208

The expected performance and estimated capital cost are presented of two schemes for the application of mechanical vapor recompression to a conventional, low pressure, five effect juice evaporator in a beet sugar factory. Due to the constraints of the existing system and the desire to make the most effective use of the capital investment, the recommendation is to install Scheme B. This selection recognizes the inability of the falling film evaporator to respond to rapid and frequent changes in capacity, and upon the need to raise the first effect vapor pressure to allow utilization of first effect bleed vapor to boil the white sugar crystallization pan. The recommended installation, Scheme B, is predicted to reduce the hourly steam consumption by up to 10,477 number/hr for an annual fuel savings of $126,800 on today's fuel cost at the Greeley Factory of the Great Western Sugar Company. This represents a 9.35% reduction in the amount of steam generated during the base year of 1978 to 1979. The estimated capital cost of the installation is $825,000. (ERA citation 05:032482)

PB82-133786 PC **A07**/MF **A01**
Colorado State Univ., Fort Collins. Dept. of Agricultural and Chemical Engineering.
Evaluation of Low-Cost Extrusion Cooker in Sri Lanka.
Special rept.,
A. A. Ackels, R. E. Gaylord, and E. E. Kuphal. Jul 77, 132p LEC-3, ID77-78-1, AID-PN-AAH-435

The low-cost extrusion cooker (LEC), a simple system used to convert indigenous grains into low-cost, nutritious foodstuffs, was developed to reduce dependence on food-for-peace programs as a means of solving LDC food supply problems. This paper evaluates the performance of a pilot LEC system in Sri Lanka, determines its suitability for use in other LDC's, and recommends changes and improvements. The investigating team spent 10 days onsite evaluating Sri Lanka's LEC system, which used the Brady Crop Cooker to cook soybeans for farm animal consumption. The evaluation focused on raw materials used, grain cleaning and storage processes, operating and performance of the B.C. and support equipment performance. The team noted improper usage of tools and parts, lack of spare parts, and machines operating with missing or damaged parts. Final recommendations for Sri Lanka LEC are: (1) to investigate and install continuous-duty equipment so that a 98% 120-hr. equipment reliability factor can be reached, (2) to improve LEC maintenance so as to increase production to at least 70% of its maximum production capacity. The authors urge prompt initiation of pilot plant LEC development program to increase world use of the system.

PB82-136292 PC **A03**/MF **A01**
National Science Council of Sri Lanka, Colombo.
Sun-Drying Methodology: Report of a Seminar, 21 May 1976.
1976, 50p

This is a report of a Seminar which dealt with principles and practice of using Sundrying methodology for agriculture and food production. The emphasis has been given to drying of paddy, tea, coconut, rubber, fish.

PB82-137852 PC **E03**/MF **E03**
Commission of the European Communities, Luxembourg.
Determination of Skimmed-Milk Powder in Feedingstuffs: Study of Some Interferences,
G. Serrini, and C. Monfrini. c1980, 26p EUR-6991-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The determination of skimmed milk powder (s.m.p.) based on the enzymatic coagulation of the para-casein has been applied to samples of buttermilk, pure s.m.p. and compound feeding-stuffs. Interference likely to be introduced by the presence of starch, various proteins or whey into the above-mentioned sample has been investigated. Accuracy and repeatability of the analyt-

ical method applied to the different samples are reported.

PB82-141078 PC **A03**/MF **A01**
American Gas Association Labs., Cleveland, OH.
Application of Intermittent Ignition Devices to Commercial Cooking Equipment.
Final rept. Jan-Dec 78,
R. L. Himmel, and R. E. Stack. Jan 81, 40p GRI-78/0050
Contract GRI-5010-341-0051

This report describes the work conducted in attempts to coordinate efforts of manufacturers of commercial cooking equipment in the investigation of residential noncontinuous pilot ignition devices for possible application to commercial cooking equipment. The term Intermittent Ignition Device (or IID) is used as an incluse term and not as the true identifier of a particular type of ignition device. Included is the description of experimental laboratory studies to determine which noncontinuous pilot ignition devices could best function in a simulated commercial kitchen environment. Results of the laboratory tests indicate that there are no known ignition devices currently on the market which will satisfy the broad range of requirements for all types of commercial cooking equipment. It was also determined that due to the harsh environmental requirements, manufacturers of electric ignition devices were not readily stimulated to begin a research program aimed at the development of an ignition device which would satisfy the necessary requirements.

PB82-141094 PC **A04**/MF **A01**
American Gas Association Labs., Cleveland, OH.
Commercial Cooking Equipment Improvement.
Annual rept. Jan-Dec 80,
R. L. Himmel. Oct 81, 61p GRI-80/0080
Contract GRI-5080-345-0255

This report describes the continuing efforts of a project aimed at improving the efficiency of gas-fired commercial cooking equipment. It specifically discusses work on deep fat fryers, range oven sections, range open top sections, range hot top sections, and range fry top sections. The infrared deep fat fryer development which demonstrated an efficiency improvement of 25 percent over conventional units was completed. Range oven work was also completed. Fuel consumption for baking cakes was further reduced to demonstrate a 55 percent reduction with the direct fired forced convection approach. A 33 percent improved range open top burner system is described which utilized an experimental power burner. Preliminary modifications to heavy duty range hot top and fry top sections demonstrated fuel savings of 43 percent and 30 percent respectively. These initial results were also obtained with laboratory type experimental burner systems and as such, all range top work needs to be continued to research other approaches and demonstrate the improved technologies on more complete experimental models.

PB82-857194 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Rice Bran and Rice Bran Oil: Food Processing. 1972-1981 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for Jan 72-Dec 81.
Dec 81, 132p
Prepared in cooperation with the International Food Information Service, Frankfurt (Germany, F.R.).

This bibliography contains citations concerning the processing of rice bran and rice bran oil. The quality of rice bran, rice milling processes, and the problems related to pelletizing parboiled rice bran are discussed. The processing, refining, and characteristics of rice bran oil are also considered, and the free fatty acid content and methods of esterification of rice bran oil are described. (Contains 139 citations fully indexed and including a title list.)

PB82-858333 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Convenience Foods: Quality and Packaging. 1972-1981 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for Jan 72-Dec 81.
Dec 81, 137p
Prepared in cooperation with the International Food Information Service, Frankfurt (Germany, F.R.).

This bibliography contains citations concerning convenience foods and the quality, packaging, and distribution of these food products. The types of food products, the quality, factors affecting quality, and the keeping quality of convenience foods are considered. Packaging, including canned, vacuum packed, frozen, and dehydrated foods are considered. Packaging of microwave-ready convenience foods are also mentioned. Microbiological studies of these foods are also mentioned. (Contains 137 citations fully indexed and including a title list.)

PB82-858341 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Capillary Chromatography of Foods. July, 1973-December, 1981 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for Jul 73-Dec 81.
Dec 81, 84p
Supersedes PB80-855661. Prepared in cooperation with the International Food Information Service, Frankfurt (Germany, F.R.).

This bibliography contains citations concerning the applications of capillary chromatography (also referred to as capillary gas chromatography or glass capillary column chromatography). The analysis of foods for fatty acids, aroma compounds, flavorings, and triglycerides are discussed. (This updated bibliography contains 75 citations, 32 of which are new entries to the previous edition.)

PB82-859331 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Poultry Meat: Microbiology. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for Jan 78-Dec 81.
Dec 81, 99p

This bibliography contains citations concerning the presence of microorganisms in raw and processed poultry and poultry products. Processing, storage conditions, and methods of cooking and reheating are considered. Salmonella and other microorganisms are discussed, and methodology for their isolation and identification are considered. (Contains 83 citations fully indexed and including a title list.)

PB82-859711 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Bread and Bakery Products: Microbiology. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for Jan 78-Dec 81.
Dec 81, 109p

This bibliography contains citations concerning the microflora of bread and other bakery products. Yeasts and bacteria used in bakery products and those contaminating the products are discussed. Bread preparation and dough starters are also discussed. The formation of mycotoxins are considered. (Contains 104 citations fully indexed and including a title list.)

6J. Industrial (Occupational) Medicine

AD-A106 848/5 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Improvements Needed in Assessing Penalties and Controlling Penalty Collections Resulting from Occupational Safety and Health Inspections.
15 Sep 81, 10p Rept no. GAO/HRD-81-150

The Occupational Safety and Health Administration's (OSHA's) inspection program is its primary means of insuring safe and healthful working conditions for about 73 million employees protected by the Occupational Safety and Health Act of 1970. During fiscal year 1980, about 132,000 violations were cited and penalties totaling about $23 million were proposed. We reviewed the adequacy of the accounting controls and procedures used by OSHA and the Office of the Solicitor for processing penalty cases and collecting and safeguarding penalty payments. Our review showed that (1) weaknesses exist in internal controls and the recordkeeping system used to account for penalties and (2) it is taking too long to deposit penalties received into the U.S. Treasury. We are also providing information on regional solicitors' policies for processing contested and collection cases. OSHA has recognized that improved internal controls and recordkeeping are needed and has made a commitment to develop improved controls and records. (Author)

DE81030980 PC **A03**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Guidance for Implementing an Environmental, Safety and Health Assurance Program. Volume 13. Model Guidelines for Line Organization Environmental, Safety and Health Meetings.
A. C. Ellingson, C. A. Trauth, Jr., and L. M. Jercinovic. Aug 81, 38p SAND-81-0644
Contract AC04-76DP00789

This is 1 of 15 documents designed to illustrate how an Environmental, Safety and Health (ES and H) Assurance Program may be implemented. The generic definition of ES and H Assurance Programs is given in a companion document entitled An Environmental, Safety and Health Assurance Program Standard. The Standard stresses participation by and feedback from employees in ES and H matters, and this document shows how ES and H meetings may be used as a framework for employee involvement in the ES and H program. Such involvement is essential for defining the acceptability of ES and H controls from an employee's perspective. (ERA citation 06:035528)

DE81030991 PC **A03**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Guidance for Implementing an Environmental, Safety and Health Assurance Program. Volume 12. Model Guidelines for Line Organization Environmental, Safety and Health Inspection and Monitoring Activities.
A. C. Ellingson. Aug 81, 44p SAND-81-0643
Contract AC04-76DP00789

This is 1 of 15 documents designed to illustrate how an Environmental, Safety and Health (ES and H) Assurance Program may be implemented. The generic definition of ES and H Assurance Programs is given in a companion document entitled An Environmental, Safety and Health Assurance Program Standard. The Standard specifies that the operational level of an institution must have internal control and assurance functions, and this document provides guidance for the inspection and monitoring activities which are a very basic part of such functions. (ERA citation 06:035527)

DE82000706 PC **A04**/MF **A01**
Department of Energy, Washington, DC. Assistant Secretary for Management and Administration.
Federal Employee Occupational Safety and Health Briefing for Management Officials.
Sep 81, 57p DOE/MA-0035

The US Department of Energy is presenting a one-hour executive briefing on the Federal Employee Occupational Safety and Health Program. This comprehensive orientation program presents an overview of information and resources for senior executives regarding their responsiblities in managing the Federal Employee Safety and Health Program, thus incorporating safety and health as an integral part of the management function. The materials and information presented at the briefing are presented in this report. (ERA citation 06:035526)

ORNL-5629 PC **A12**/MF **A01**
Oak Ridge National Lab., TN.
ORNL Coal Chemistry Report, 1979. Executive Summary.
W. R. Grimes, M. R. Guerin, O. L. Keller, M. L. Poutsma, and J. S. Watson. Feb 80, 269p
Contract W-7405-ENG-26

The ORNL Coal Chemistry Report for 1979 outlines the existing and needed chemical bases for current and future coal utilization in direct combustion, liquefaction, and gasification and also for chemical feedstocks. We include recommendations for chemical developments needed to underpin production of energy, fuels, and chemical products from coal and also recommendations related to environmental and health effects. Various methods of chemical analysis of coal materials are described with detection limits, and applicability to particular elements. (ERA citation 05:011118)

PB82-100033 MF **A01**
Bureau of Labor Statistics, Washington, DC. Office of Occupational Safety and Health Statistics.
Occupational Injuries and Illnesses, Virgin Islands, 1979.
Final rept.
1981, 462p BLS/SDS/VI-79
See also report for 1978, PB80-174980.
Microfiche copies only.

This document contains 56 tabulations of characteristics of occupational injuries and illnesses related to industry, occupation, duration of employment, wage, and age of the injured or ill worker. Data was compiled by the Virgin Islands Department of Labor from records of workers' compensation cases that were received during 1979 and involved one or more lost workdays and/or medical treatment. Data include cases arising in public employments, and in private employments with the exception of household workers, employees of religious and/or charitable organizations, and casual employees in a private home. In addition, Federal, railroad and maritime employments are not covered by the State act and cases involving such employees are not included in these data.

PB82-100041 MF **A01**
Bureau of Labor Statistics, Washington, DC. Office of Occupational Safety and Health Statistics.
Occupational Injuries and Illnesses, Idaho, 1979.
Final rept.
1981, 1226p BLS/SDS/ID-79
See also report for 1978, PB80-217227.
Microfiche copies only.

This document contains 56 tabulations of characteristics of occupational injuries and illnesses related to industry, occupation, duration of employment, wage, and age of the injured or ill worker. Data was compiled by the Idaho Industrial Commission from records of workers' compensation cases. Tables are based on cases which occurred during 1979. Data include cases arising in public employments; and in private employments with the following principal exceptions for which voluntary coverage is permitted: agricultural workers, household workers, casual employees, members of the employer's immediate family, certain corporate officers, employees of nonprofit, religious, and charitable institutions, working members of partnerships, certain pilots, real estate brokers, and outworkers. In addition, Federal and railroad employments are not covered by the State act and cases involving such employees are not included in these data.

PB82-100058 MF **A01**
Bureau of Labor Statistics, Washington, DC. Office of Occupational Safety and Health Statistics.
Occupational Injuries and Illnesses, Wisconsin, 1979.
Final rept.
1981, 1729p BLS/SDS/WI-79
See also report for 1978, PB81-141988.
Microfiche copies only.

This document contains 70 tabulations of characteristics of occupational injuries and illnesses related to industry, occupation, wage, and age of the injured or ill worker, and indemnity compensation and extent of disability of the injury or illness. Data was compiled by the Wisconsin Department of Industry, Labor, and Human Relations from records of workers' compensation cases. Tables are based either on cases which were received during 1979, or compensated cases closed during 1979 regardless of the date of occurrence. Data include cases arising in public and private employments with these principal exceptions, for which voluntary coverage is permitted: certain private employments with two or fewer employees, certain farms with five or fewer employees or with six or more employees each employed for fewer than 20 days per calendar year, household workers, and certain casual workers. In addition, Federal, railroad, and maritime employments are not covered by the State act and cases involving such employees are not included in these data.

PB82-107103 PC **A05**/MF **A01**
SRI International, Menlo Park, CA.
Industrial Hygiene Survey Report at Celotex Corporation, Pittston, Pennsylvania.
Industrywide study,
Douglas P. Fowler. 4 Oct 77, 90p IWS-35.31
Contract PHS-NIOSH-210-76-0120

Air sampling, noise and ventilation surveys were conducted at a facility of the Celotex Corporation (SIC-3296) in Pittston, Pennsylvania, on October 4, 1977. First air was administered by supervisors and trained hourly employees. Pre-employment and periodic examinations were given. The facility had an industrial hygiene supervisor. Earplugs and safety glasses were given to all employees whose job required them. High noise levels were found in the cupola and tile line areas and during the use of air line for cleaning processing equipment. Housekeeping was generally adequate. The enclosure around the spinner in the cupola area did not prevent occasional ejection of molten slag and metal, and emission of fumes and smoke into the area where the cupola operator was located. The potential for inhaling toxic material was found in some areas. Workers were not exposed to total particulate material concentrations above the OSHA limit. The highest respirable particulate value was 1.661 milligrams per cubic meter and all respirable samples were below the OSHA limits. The author recommends replacing Wollastonite with a non-fibrous substitute in the paint mix area, the use of protective gear, periodic maintenance and monitoring of the ventilation system and noise levels, ventilation and cupola area improvements, surveying workers for asbestos exposure and close medical surveillance of workers exposed to airborne Wollastonite.

PB82-107178 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Div. of Field Studies and Clinical Investigations.
Asbestos Dust and Preliminary Industrial Hygiene Survey at World-Bestos, the Firestone Tire and Rubber Company in New Castle, Indiana.
Industrywide study,
John Dement. Sep 71, 24p IWS-32.35B

Workers exposures to asbestos (1332214) were determined at the World-Bestos division of the Firestone Tire and Rubber Company (SIC-7539) in New Castle, Indiana, from September 20 to 24, 1971. The facility employed approximately 225 workers and had a safety director with no staff. No doctors or nurses were employed at the facility. Respirators were worn by wet and dry mixing operators and in the truck block performing operations. Ear protection devices and aprons and gloves were supplied by the company. Samples taken with a filter membrane ranged from 0.1 fibers greater than 5.0 microns in length per cubic centimeter (f/cc) for a surface grinder to 33.6f/cc for one hot press operator. The author concludes that potential hazards are exposure to asbestos dust, lead from mixing operations and noise. He recommends modifications and improvements in the ventilation systems, use of a vacuum system to clean-off machines and work clothes, and reductions in the noise levels of the hopper vibrator in the wet mix area.

PB82-107186 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Div. of Field Studies and Clinical Investigations.
Men's Apparel Industrywide Study at Gant Shirtmakers Division of Consolidated Foods, Salisbury, MD.
Industrywide study,
Peter J. Nord. 19 Sep 74, 6p IWS-46.19

Hazards associated with the man's apparel industry were surveyed on May 9, 1974, at Gant Shirtmakers (SIC-2321) in Salisbury, Maryland. The company employed 50 cutters and 300 stitchers. Some workers were trained in first aid, and a local physician was available for serious injuries. The safety committee was composed of foremen, maintenance men and the general manager. Materials used were permanent press cottons and synthetics. Air conditioning was used for ventilation. Dust and lint was found in a few areas of the facility, but no sampling was performed. Noise levels were below 60 to 87 decibels, and lighting levels were 100 to 500 foot candles. The author concludes that dust and lint may pose a respiratory hazard, especially if formaldehyde is released. Recommendations include characterization of airborne dust, testing of pulmonary function among the workers, determination of time weighted average noise exposures, and audiometric testing of workers exposed to noise levels greater than 85 decibels.

PB82-107194 PC **A04**/MF **A01**
SRI International, Menlo Park, CA.
Industrial Hygiene Survey Report at U.S. Gypsum Corporation, Birmingham, Alabama.
Industrywide study,
Douglas P. Fowler. Apr 78, 74p IWS-35.32
PHS-NIOSH-210-76-0120

Worker exposure to mineral wool fibers and total airborne and respirable particulate material was determined from air samples at the U.S. Gypsum Corporation (SIC-3275) in Birmingham, Alabama, from October 25 to 29, 1976. The facility employed approximately 92 persons. First aid was given by supervisors. Pre-employment physical examinations were given before initial employment and after substantial lay-off periods, and examinations were given every 5 years to all employees and yearly to those over 60. The corporate headquarters administered the industrial hygiene and environmental control programs. No local safety or industrial hygiene program manager was employed at the facility. Protective equipment was provided for certain personnel. Housekeeping was a continuous problem. The equipment was old and needed constant attention to function. The concentrations of air contaminants were below NIOSH limits. Chargers, cupola operators, front-end leaders and battline take-off workers were exposed to the highest concentrations of airborne particulates. The author concludes that cupola operators were exposed to the highest combined overall concentrations of airborne fibers and total airborne particulate material.

PB82-107202 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Results of Air Samples of Johns-Manville in Marshville, North Carolina.
Industrywide study.
Dec 67, 6p IWS-32.18B
See also PB81-241853.

Dust concentration was measured at the Johns-Manville Company (SIC-2283), in Marshville, North Carolina, in December, 1967. Sampling was performed with a membrane filter. The breathing zone membrane filter samples ranged from 107.7 to 0.0 fibers per cubic centimeter (f/cc) for the card tender and slubber operator, respectively. The personal membrane filter samples ranged from 48.9 to 0.1 (f/cc) for the card tender and inspector, respectively.

PB82-107210 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Health Hazard and Technical Assistance Branch.
Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
Dawn Gilles Tharr, and Michael Donnohue. Sep 80, 25p Rept no. NIOSH-HE-79-80

Environmental and personal samples were analyzed for isopropyl-alcohol (67630), cyclohexanone (108941), tetrahydrofuran (109999) (THF), toluene (108883), methyl-ethyl-ketone (78933) (MEK), ethylene-oxide (75218), Freon-12 (75718), toluene-diisocyanate (26471625) (TDI), methylene-chloride (75092), ethylene-dichloride (107062), perchloro-ethylene (127184), and methylene-bisphenyl-isocyanate (101688) (MDI) at Cobe Laboratories, Incorporated (SIC-3840) in Lakewood and Arvada, Colorado, from August 13 to 15, 1979. Medical questionnaires were administered to 140 workers. The evaluation was requested by individual employees on behalf of an unspecified number of affected workers. Measured concentrations of isopropyl alcohol, cyclohexanone, THF, toluene, MEK, ethylene-oxide, and Freon-12 were undetectable. Environmental samples collected for methylene-chloride revealed concentrations ranging from 15 to 187 parts per million (ppm) compared with the OSHA recommended standard of 500ppm. Ethylene-dichloride concentrations ranged from 1.5 to 3.2ppm, well below the OSHA standard of 50ppm. Perchloroethylene concentrations ranged from 7 to 29ppm, compared to the OSHA standard of 100ppm. Assembly line workers reported respiratory difficulties, but no significant incidence of eye or skin irritation, tumors, anemia, or neurologic problems was noted. The authors conclude that a potential health hazard exists from exposures to methylene-chloride, ethylene-dichloride, and possibly perchloro-ethylene. Recommendations include employee training, ventilation improvements, and medical monitoring of exposed workers.

PB82-107228 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Health Hazard and Technical Assistance Branch.
Health Hazard Evaluation Report No. HE-79-14-760 at General Electric Company, Evendale,Ohio,
John R. Kominsky, Theodore Thoburn, and Mitchell Singal. Oct 80, 12p NIOSH-HE-79-14-760

Worker exposures to metallic vanadium (7440622) and airborne particulates were investigated at the General Electric Company (SIC-3510) in Evendale, Ohio, on January 25 and May 22, 1979, in response to a request from an authorized representative of the United Automobile Workers International Union, Local 647. Thirteen personal air samples were collected in the jet engine fan blade finishing area where approximately 88 workers were employed in two shifts. None of the samples contained vanadium in excess of the OSHA 1.0 milligram per cubic meter (mg/cu m) standard. The maximum 8 hour time weighted average (TWA) exposure to vanadium was 0.097 mg/cu m. Total particulate concentration in the outside shroud area was 16.8 mg/cu m, in excess of the 15.0 mg/cu m OSHA standard. Hearing loss, nose bleeds, sinus problems, headaches, nose irritations, bronchitis, and shortness of breath were reported by 14 of 27 interviewed workers. The authors conclude that outside shroud area workers were exposed to harmful particulate concentrations. They recommend protective equipment for workers in areas with particulate concentrations in excess of 15.0 mg/cu m and at fan polishing work sites. Ventilation should be inspected periodically.

PB82-107236 PC **A03**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Health Hazard and Technical Assistance Branch.
Health Hazard Evaluation Report No. HE-80-159-752 at Mountain Bell, Denver, Colorado,
Paul Pryor. Oct 80, 33p NIOSH-HE-80-159-752

Worker exposure to ammonia (7664417) was investigated at the Central Staff Communications Laboratory of Mountain Bell (SIC-7330) in Denver, Colorado, during August, 1980, in response to a request from an employee representative. A total of 30 workers were employed by the company. Personal and area air samples were collected and analyzed. All of the samples were well below the recommended evaluation criteria of 50 parts per million. The author recommends that conformance with recognized ammonia health and safety practices be continued and reviewed on an annual basis. A copy of the manual for ammonia handling is included.

PB82-107244 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Chloroacetaldehyde (Analytical Method S11).
3 Aug 79, 15p

The NIOSH analytical method S11 for determining chloroacetaldehyde (107200) in air is described. Samples are collected on Silica gel, desorbed with methanol and analyzed by gas chromatography with electron capture detectors. The working range on the method is 1.8 to 6.4 milligrams per cubic meter, the coefficient of variance is 0.06 and the limit of detection of 100 nanograms. Analytical equipment, reagents and procedures are described, and mathematical formulas for calibration and standardization are included.

PB82-107251 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Prevention of Low Back Injury in the Industrial Work Force: Symposium Held at Cincinnati, Ohio on November 9, 1972,
Donald W. Badger, Francis N. Dukes-Dobos, and Donald B. Chaffin. 9 Nov 72, 11p
Prepared in cooperation with Michigan Univ., Ann Arbor. Dept. of Industrial and Operations Engineering.

The proceedings of NIOSH sponsored symposium on the prevention of low back injury (LBI) in the industrial workforce are summarized. Clinical and scientific studies on LBI are described, including research on diagnostic and treatment procedures, screening methods and models of the musculoskeletal system. The authors recommend an intensive, coordinated research program to provide information on effective ways to reduce the incidence of LBI. Tests should be developed to objectively assess employee strength and health, and studies are needed on the relationship between work practices and the incidence and severity of LBI on spinal column aging. Workplace engineering and psychosocial factors affecting LBI also should be investigated.

PB82-107269 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Div. of Field Studies and Clinical Investigations.
Men's Apparel Industrywide Study: Fechheimer Bros. Co., Cincinnati, Ohio.
Industrywide study,
Peter J. Nord. 19 Sep 74, 6p IWS-46.14

Hazards associated with the men's apparel industry were surveyed in April 2, 1974, at Fechheimer Brothers Company (SIC-2311) in Cincinnati, Ohio. The company employed 200 workers. Medical services were provided by one woman trained in first aid. Materials used were wool and wool blends. Ventilation was provided by an air conditioning system. Sewing machines were equipped with needle guards. A hot wire process was used to seal the plastic film employed for wrapping pants. The general noise level was 68 to 70 decibels, and general area lighting levels were 125 foot candles. No dust measurements were taken, however, the work areas appeared clean and relatively dust free. The author recommends characterization of thermal decomposition products generated during the hot wire sealing process.

6K. Life Support

AD-A107 107/5 PC **A10**/MF **A01**
Naval Air Development Center, Warminster, PA. Aircraft and Crew Systems Technology Directorate.
Development of Automatic Inflation Devices for Life Preservers.
Final rept.,
Jules Z. Lewyckyj. 31 Jul 81, 217p Rept no. NADC-81226-60

This historical description covers the various commands and countries involved in development of automatic inflation devices (with a manual override) that would inflate a life preserver automatically on water contact when the wearer enters the water and is incapable of manually inflating his preserver. These developments began when a number of military personnel involved in deck and ejection seat aircraft operations at sea became convinced that a disabled person, wearing a life preserver, might have a much better chance of survival if the life preserver inflated automatically after the wearer was in the water.

AD-A107 488/9 PC **A02**/MF **A01**
Naval Coastal Systems Center, Panama City, FL.
Carbon Dioxide Absorption Characteristics of High Performance Sodasorb at 1 Atmosphere.
Technical Memo. FY 1980-81,
A. Purer, G. A. Deason, M. L. Nuckols, and J. F. Wattenbarger. Oct 81, 22p NCSC-TM-327-81, SBIE-AD-F200 014

Standardized methods have been developed to evaluate the efficiency of different carbon dioxide absorbents. Effects of moisture, absorbent cell dimensions, linear velocity, and temperature have been included in this investigation. The use of such standardized procedures will allow data comparisons which have not been possible. The engineering data should also be directly applicable to future canister design.

6L. Medical and Hospital Equipment

AD-A106 824/6 PC **A04**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Testing of RPMI-1640 as a Nutrient Medium for Fresh Semilunar Valve Storage.
James Beverly Nichols. 1979, 75p Rept no. AFIT-CI-79-302T-S

RPMI 1640 medium was evaluated for heart valve storage. Valves from 16 dogs were placed in the medium. The pulmonic valves were removed from the medium at 15 to 135 days and tested for viability by histopathology and the aortic valves were surgically implanted in recipient dogs for 81 to 85 days. At the end of that period of time, the dogs underwent cardia catheterization, afterwards euthanitized and the valves harvested for histopathological study. (Author)

AD-A107 525/8 Not available NTIS
Scanning Electron Microscopy, Inc., Chicago, IL.
Scanning Electron Microscopy/1981/III. An International Journal of Scanning Electron Microscopy, Related Techniques, and Applications. Part III,
R. M. Albrecht, D. N. Holcomb, M. Kalab, A. Reith, and I. B. Sachs. 1981, 666p ARO-18155.1-L
Contract DAAG29-81-M-0092
Availability: Scanning Electron Microscopy, Inc. P.O. Box 66507, AMF O'Hare, Chicago, IL 60666. HC $52.00 (No copies furnished by DTIC/NTIS).

Part I contains papers of general interest, techniques, and physical applications. Part II contains general papers of biological interest, including cell biology, cell culture, biological microanalysis, and related topics. Part III contains papers on biological applications, including cancer, clinical applications, biomedical applications, mineralized tissue, plants, and food microstructures. Part IV will contain papers on all topics which were processed after above parts were prepared. This division of papers is same as in 1980 volume.

N82-11211/1 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Fabrication and Wear Test of a Continuous Fiber/Particulate Composite Total Surface Hip Replacement.
J. C. Roberts, F. F. Ling, and W. R. Jones, Jr. 1981, 29p NASA-TM-81746, E-709
Contract DAAG29-79-C-0204
Presented at the Joint Lubrication Conf., New Orleans, 5-7 Oct. 1981; Cosponsored by Asme and the AM. Soc. Of Lubrication Engr.

Continuous fiber woven E-glass composite femoral shells having the ame elastic properties as bone were fabricated. The sheils were then encrusted with filleld epoxy wear resistant coatings and run dry against ultrahigh molecular weight polyethylene acetabular cups in 42,000 and 250,000 cycle were tests on a total hip simulator. The tribological characteristics of these sheils atriculating with the acetabular cups are comparable to a vitallium bal articulating with an ultrahigh molecular weight polyethylene cup.

PAT-APPL-6-288 197 PC **A02**/MF **A01**
Department of Health and Human Services, Washington, DC.
Motorized Wheel Chair.
Patent Application,
John H. Loveless. Filed 29 Jul 81, 9p PB82-137522
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

This patent invention application relates to motorized wheel chairs, and more particularly to a motorized wheel chair having manually operated transducers to control the drive motors of the chair in accordance with the speed of actuation of the transducers.

PATENT-4 239 041 Not available NTIS
Department of Health and Human Services, Washington, DC.
Method for Continuous Ambulatory Peritoneal Dialysis.
Patent,
Robert P. Popovich, and Jack W. Moncrief. Filed 4 Aug 78, patented 16 Dec 80, 9p PB82-137217, PAT-APPL-931 098
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

A process for the removal of toxins from the body in a continuous manner while the patient is totally ambulatory. The process involves the infusion of a dialysate fluid under prescribed conditions into the peritoneal cavity. The toxic solutes are transported across the peritoneum membrane into the dialysate fluid by the natural processes of diffusion and convection. The dialysate fluid and the toxins are then removed after a prescribed residence phase. Apparatus includes an indwelling balloon catheter surgically implanted within

the peritoneal cavity of a patient, a dacron cuff surgically attached to the abdominal wall, and an external quick connect coupling attached to the catheter. Apparatus may also include a wearable microbiological filter unit for reducing the risk of peritonitis during infusion of dialysate fluid.

PB82-141847 PC **A06**/MF **A01**
Young (Arthur) and Co., Washington, DC.
A Profile of the Medical Technology Industry and Governmental Policies. Appendix A: Review and Assessment of Secondary Data Sources for Developing a Profile of the Medical Technology Industry.
Final rept. 1 Oct 79-30 Jun 81,
H. Elizabeth Wenchel. 30 Jun 81, 121p NCHSR-81-225
Contract PHS-233-79-3011
See also Volume 2, PB82-141839. Prepared in cooperation with the Emergency Care Research Inst., Plymouth Meeting, PA.
Also available in set of 3 reports PC E15, PB82-141813.

This document is one part of a three-part report profiling the medical technology industry using an industrial organization (I.O.) economics approach and secondary data sources. Appendix A provides an analysis of the adequacy and availability of the various aggregated, firm specific, and specialized data bases. Collectively the documents contribute to the identification of influences affecting innovation and the description of what has happened to firms entering or exiting the market and factors associated with survival. The application of the industrial organizational methodology was tested in a case study of the cardiac pacemaker industry. The limitations of using existing secondary data sources for such analyses are discussed in detail.

PB82-802695 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Dental Materials and Equipment. September, 1979-November, 1981 (Citations from the NTIS Data Base).
Rept. for Sep 79-Nov 81.
Dec 81, 104p
Supersedes PB80-814213, and NTIS/PS-79/0895.

The selected abstracts cover adhesives, surgical implantation, tissue compatible materials, composite materials, dental supplies, denture base material and dental cements. (This updated bibliography contains 96 citations, 13 of which are new entries to the previous edition.)

PB82-802901 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Dental Prostheses. 1964-November, 1981 (Citations from the NTIS Data Base).
Dec 81, 185p
Supersedes PB80-813926, and NTIS/PS-79/0916.

Dental research, preventive dentistry, rehabilitation, implantation, biomaterials, dental equipment, oral surgery, cleansing agents and adhesives are the subjects covered by the selected abstracts. (This bibliography contains 177 citations, 9 of which are new entries to the previous edition.)

PB82-859950 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Cardiac Pacemakers. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 101p
Supersedes PB81-860546. Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning the 'state of the art' of cardiac pacemakers. Protection against shock and acceleration, the hazards of electric and magnetic fields, and the importance of reliability and therapeutic efficiency are noted. Also included are disscussions of fixed frequency and demand pacemakers. Energy sources and design are outlined, and patents are noted. (This updated bibliography contains 104 citations, 12 of which are new entries to the previous edition.)

6M. Microbiology:

AD-A107 012/7 Not available NTIS
Connecticut Univ. Health Center, Farmington.
Biochemistry of Bacterial Forespore Development and Spore Germination,
Peter Setlow. 1981, 17p ARO-17029.1-L
Contract DAAG29-80-C-0062, Grant PHS-GM-19698
Availability: Pub. in Spores VIII, p13-28 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

6O. Pharmacology

AD-A106 950/9 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Effects of Intravenous 16,16 Dimethyl Prostaglandin E2 on Bile Salt Induced Injury to Gastric Mucosa in Canine Heidenhain Pouches,
John W. Harmon, and Clifford Lewis. 1979, 12p
Pub. in Prostaglandins, v21 p103-112 1979.

No abstract available.

AD-A106 951/7 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Preferential Inhibition of Ribonucleic Acid Synthesis by a New Thiosemicarbazone Possessing Antibacterial and Antiparasitic Properties,
R. E. Brown, F. A. Stancato, and A. D. Wolfe. 1980, 5p
Pub. in Antimicrobial Agents and Chemotherapy, v19 n2 p234-237 Feb 81.

No abstract available.

AD-A106 953/3 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Antisecretory Effects of Berberine in Rat Ileum,
Yuan-Heng Tai, Jeanette F. Feser, William G. Marnane, and Jehan-F. Desjeux. 16 Dec 80, 8p
Pub. in American Jnl. of Physiology: Gastrointestinal Liver Physiology, v241 pG253-G258 1981.

No abstract available.

AD-A106 958/2 PC **A04**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
2-Acetyipyridine Thiosemicarbazones. 3. Selenium Analogs as Potential Antimalarial Agents,
Daniel L. Klayman, John P. Scovill, Joseph F. Bartosevich, and Carl J. Mason. 22 Oct 80, 61p
Pub. in European Jnl. of Medicinal Chemistry-Chimica Therapeutica, v16 n4 p317-320 Jul-Aug 81.

No abstract available.

AD-A106 962/4 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Determination of N-Methyl Pyridinium-2-Aldoxime Chloride and Its Hydrolytic By-Products by Ion-Pair High-Performance Liquid Chromatography,
Nesbitt D. Brown, M. Patricia Strickler, H. Kenneth Sleeman, and Bhupendra P. Doctor. 27 Apr 81, 6p
Pub. in Jnl. of Chromatography, v212 p361-365 1981.

No abstract available.

DE81030813 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Chemicals Identified in Human Biological Media.
M. V. Cone, and C. Stroup. 1981, 6p CONF-810959-1
Contract W-7405-ENG-26
EPA/NCI annual collaborative workshop on environmental and occupational cancer studies, Rockville, MD, USA, 9 Sep 1981.

Sources of data for Chemicals Identified in Human Biological Media are from the world literature, retrospective to 1974. Information from approximately 1500 documents is in the data base at the present time. The data base contains information on 750 chemicals. Approximately 250 of these were added since this time last year. Approximately 10% of the total documents in the file concerned pesticides; 30%, drugs; and 40%, metals. The remaining 20% were about other substances, including industrial chemicals and organics which are of interest to NCI and EPA. (ERA citation 06:035514)

PB82-129164 CP **T02**
Food and Drug Administration, Rockville, MD. Bureau of Drugs.
Approved Prescription Drug Products with Therapeutic Equivalence Evaluations.
Data file,
Gary C. Collins, and Delores D. Willis. 1981, mag tape FDA/DF-81/004
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

This data file was created to allow computer processing of data from the Approved Prescription Drug Products with Therapeutic Equivalence Evaluations (APDP). Each record contains the information required to identify a particular drug product. Other information regarding conventions and use of the data is contained in the preface to the APDP. To facilitate processing, there is some duplication of information among records so that each record contains all identifying information. In addition, for each record one NDA or ANDA number is included although more than one may apply to the particular drug product identified. The possibility of multiple numbers exists because the applicant may have more than one NDA or ANDA approved for the same drug product within the context of the data in the APDP. The distinguishing information may be package size, excipients, distributors, etc.

PB82-129735
(Order as PB82-129628, PC **A05**/MF **A01**)
Beijing Medical Coll. (China).
Initial Results of In Vitro Studies of Clavulanic Acid Synergism,
Jiatal Li, Mei Feng, Lingjia Ma, Wenyuan Tao, and Sen Wang. 1981, 5p
Included in Chinese Medical Jnl., v94 n9 p617-621 1981.

Clavulanic acid is a potent beta-lactamase inhibitor. Its synergistic effect on the minimum inhibitory concentration and minimum bactericidal concentration of furbenicillin, ampicillin, or carbenicillin against clinical isolates resistant to beta-lactam antibiotics is initially estimated.

PB82-134420 PC **A07**/MF **A01**
Ohio State Univ. Research Foundation, Columbus.
Deviance Within a Model of Superior Formulary Performance.
Final rept. May 80-Apr 81,
T. Donald Rucker. 30 Apr 81, 130p FDA/BD-82/3

This report reviews selected characteristics associated with the implementation of drug formularies utilized by a small number of leading medical centers. While these instruments can be constructed to serve administrative or economic ends, this investigation assumes that their primary purpose is to identify drugs whose relative safety and efficacy are superior to competing alternatives.

PB82-136961 PC **A14**/MF **A01**
National Inst. on Drug Abuse, Rockville, MD. Div. of Research.
Behavioral Pharmacology of Human Drug Dependence.
Research mono.,
Travis Thompson, and Chris E. Johanson. Jul 81, 308p DHHS/PUB/ADM-81-1137, NIDR/DR-81-05
Also pub. as National Institute on Drug Abuse Research Mono. 37.

A review of the contributions of research on behavioral mechanisms of drug dependence, to interpret the relation of animal and human behavioral pharmacology findings to prevention of human drug dependence. The monograph brings together concepts from clinical and behavioral pharmacology and seeks the common processes underlying various forms of substance abuse. It describes effects of personality and the individual's history of drug exposure upon drug self-administration and discusses control of drug-related behavior by external and internal stimuli. Other sections deal with commonalities and differences among reinforcers and the maintenance of drug dependence by complex second-order schedules, in which drug-using behavior

is maintained by environmental stimuli only remotely linked with drug administration. Intended readership includes clinicians, researchers, pharmacologists, and others interested in behavioral analysis and treatment of drug dependence.

PB82-139106 PC **A06**/MF **A01**
National Inst. on Drug Abuse, Rockville, MD. Div. of Research.
Benzodiazepines: A Review of Research Results, 1980.
Research mono.,
Stephen I. Szara, and Jacqueline P. Lundford. Nov 81, 112p DHHS/PUB/ADM-81-1052, NIDR/DR-81-06
Also pub. as National Inst. on Drug Abuse Research mono. 33. Report of the RAUS (Research Analysis and Utilization System) Review Conference on Benzodiazepines held September 12, 1980, Rockville, Maryland.

Benzodiazepines, the so-called 'minor tranquilizer' drugs, are very widely prescribed and used. The discovery of specific binding sites in the brain (1977) has made research on benzodiazepine receptors and their relation with neurotransmitter mechanisms a most active area of psychopharmacology. In addition, public interest in abuse potential and dependence liability of benzodiazepines is high. This monograph is based on a RAUS (Research Analysis and Utilization System) Review Conference held September 12, 1980. RAUS each year selects certain subject areas for intensive review, collects findings of all relevant intramural and extramural research supported by the National Institute on Drug Abuse, has them evaluated by scientific peers, then holds evaluative meetings to discuss findings and develop specific recommendations for future research. Subjects covered in this monograph include: basic biochemistry and neuroanatomy underlying the question of abuse potential of benzodiazepines, including the existence and sites of receptors involved; studies on self-administration in animals and humans; carryover effectiveness, rebound insomnia, and performance effects; clinical use patterns; misuse, abuse, and dependence.

PB82-802604 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Psychotropic Drug Research. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 276p
Supersedes PB80-814197, and NTIS/PS-79/0897.

Research reports are cited on the pharmacology of hypnotics and sedates, tranquilizers, hallucinogens, antidepressive agents, alcohols, amphetamines, and caffeine. Studies related to the utilization, rehabilitation, behavior, and social problems of drug abuse have been excluded. (This updated bibliography contains 269 citations, 39 of which are new entries to the previous edition.)

PB82-859315 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Cocaine: Metabolism, Toxicity, and Behavioral Effects. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for Jan 78-Dec 81.
Dec 81, 131p

This bibliography contains citations concerning the metabolism, toxicity, and behavioral effects of cocaine. Primary emphasis is on animal studies. Behavioral profiles following the administration of cocaine are detailed. Methods of seperation and quantitation from blood and urine are discussed. (Contains 120 citations fully indexed and including a title list.)

PB82-923700 Subscription
Food and Drug Administration, Rockville, MD. Bureau of Drugs.
FDA Drug and Device Product Approvals.
Monthly repts.
1981, 12 issues
Supersedes PB81-923700.
Paper copy available on subscription, North American Continent price $50.00/year; all others write for quote. Also available in single copies.

The publication lists the New Drug Applications (NDA's), Antibiotic Form 5's and 6's, Abbreviated New Drug Applications (ANDA's) approved during the previous month. It also contains New Animal Drug Applications (NADA's), Biologic Licenses and Premarketing Device Application Approvals. Supplemental Application approvals are also listed.

6P. Physiology

AD-A106 978/0 Not available NTIS
Harvard-MIT Div. of Health Sciences and Technology, Cambridge, MA.
Power Spectrum Analysis of Heart Rate Fluctuation: A Quantitative Probe of Beat-to-Beat Cardiovascular Control,
Solange Akselrod, David Gordon, F. Andrew Ubel, Daniel C. Shannon, and A. Clifford Barger. 1981, 4p
Contract N00014-80-C-0520, Grant NSF-ECS79-22091
Sponsored in part by Grants PHS-HL-19467 and SO7-RR-07047.
Availability: Pub. in Science, v213 p220-222, 10 Jul 81 (No copies furnished by DTIC/NTIS). Microfiche copies only.

No abstract available.

AD-A107 102/6 Not available NTIS
Mississippi State Univ., Mississippi State. Dept. of Biochemistry.
Odorant Responses of Na(+) -K(+) ATPase Activity by Preparations from Paired Turbinals of Rat Olfactory Tissue,
Hernan Rossi, and Robert B. Koch. Jul 80, 6p ARO-16867.1-L
Contract DAAG29-80-C-0033
Availability: Pub. in Chemical Senses, v6 n2 p113-117 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 162/0 Not available NTIS
Mississippi State Univ., Mississippi State. Dept. of Biochemistry.
Effect of Antibody to Anisole Binding Protein on Odorant Perturbation of Na(+) -K(+) ATPase Activity,
R. B. Koch, Hernan Rossi, and Steven Price. May 80, 6p ARO-16867.2-L
Contract DAAG29-80-C-0033
Prepared in cooperation with Medical Coll. of Virginia. Dept. of Physiology, Grant PHS-DE-04271.
Availability: Pub. in Chemical Senses, v6 n2 p95-99 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 324/6 PC **A03**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Isometric, Isotonic, and Isokinetic Torque Variations in Four Muscle Groups through a Range of Joint Motion,
Joseph J. Knapik, James E. Wright, Roberta H. Mawdsley, and Joanne Braun. 4 Sep 81, 38p Rept no. USARIEM-M-2/82

This investigation described and examined variations in maximal torque production in knee extension, knee flexion, elbow extension, and elbow flexion through a range of joint motion. Subjects were young, healthy male (N = 16) and female (N = 15) soldiers. For all muscle groups torque was measured during maximal voluntary isometric and isokinetic contractions using a modified Cybex apparatus. Isotonic torque was calculated from a one repetition maximum using a modified N-K device. Joint angle curves were constructed for both genders and for each of the four muscle groups. Variations in torque were explained in terms of mechanical characteristics of the musculoskeletal system. Maximal capability of the muscle groups and external loading demands were discussed. The shift in peak torque with increasing velocity of isokinetic contraction was attributed to certain time requirements of the movement. Torque was found to decrease with increasing velocity of contraction. (Author)

AD-A107 453/3 PC **A06**/MF **A01**
Norwegian Defence Research Establishment, Kjeller.
Neurotransmitter Mechanisms in the Nucleus Accumbens Septi and Related Regions in the Rat Brain.
Rept. for 1976-1979,
Ivar Walaas. 30 Jun 81, 113p Rept no. NDRE/PUBL-81/1001

The present investigation compares the localization of different transmitter candidates, particularly the amino acids gamma-aminobutyrate (GABA) and glutamate (GLU), in limbic and basal ganglia regions in the rat brain. In particular, the characteristics of nucleus accumbens septi have been studied in some detail. GABA neurons have been found in nucleus accumbens, and GABA projections from this nucleus have been identified in restricted basal forebrain and mesencephalic regions. GLU projections from the neo- or allocortex have been found to terminate in nucleus accumbens and other forebrain and hypothalamic nuclei. Neurotransmitters in local neurons have been identified in the hippocampus, nucleus accumbens, septum and caudatoputamen by means of local kainic acid injections, while neurons in the mediobasal hypothalamus have been studied after systemic treatment of newborn animals with monosodium glutamate. The results are discussed as a basis for a better understanding of limbic-basal ganglia interactions.

PB82-127432 PC **A02**/MF **A01**
Health Effects Research Lab., Research Triangle Park, NC.
Dopamine Depletion Slows Retinal Transmission.
Journal article,
Robert S. Dyer, William E. Howell, and Robert C. MacPhail. Sep 81, 17p EPA-600/J-80-014
Pub. in Experimental Neurology 71, p326-340 1981.

In male hooded rats, depletion of norepinephrine and dopamine by a-methyl-paratyrosine (AMT) significantly increased the latencies of early peaks in flash-evoked potentials recorded from the visual cortex, lateral geniculate nucleus, and optic tract. These effects were not produced by depletion of norepinephrine by FLA-63, blockade of muscarinic acetylcholine receptors by scopolamine, or blockade of opiate receptors by naloxone. AMT effects occurred only when flashes were used; optic tract stimulation failed to reveal the drug-induced changes. In a dose-response study, haloperidol produced effects similar to those of AMT. L-Dopa + R04-4602 reversed some of the effects of AMT. It is concluded that depletion of retinal dopamine impairs the timing of retinal responses to light.

PB82-129321 PC **A06**/MF **A01**
Thermo Electron Corp., Waltham, MA.
Research and Development: Systems for Transmitting Energy Through the Intact Skin.
Annual rept. Jul 80-Mar 81,
F. Fraim, B. Daly, C. Sherman, K. Dasse, and M. Szycher. Apr 81, 121p NIH-N01-HV-0-2093-1
Contract N01-HV-0-2093

This report covers the work performed during the first nine months of a three-year program. Coils and associated power conditioning hardware were designed and fabricated to transmit electrical power through intact skin. System efficiency of 80 percent has been achieved while transmitting 40 watts of power. In vivo results indicate that the coils are well tolerated for periods of two months.

PB82-802687 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electroretinography. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 112p
Supersedes PB80-813892, and NTIS/PS-79/0914.

Research reports are cited on the use of electroretinography to study physiological processes of the eye. Studies are included on dark adaptation, color vision, visually evoked responses, visual performance, and radiation effects. (This updated bibliography contains 123 citations, 3 of which are new entries to the previous edition.)

6Q. Protective Equipment

AD-A107 105/9 PC **A03**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Effectiveness of Five Water-Cooled Undergarments in Reducing Heat Stress of Vehicle Crewmen Operating in a Hot Wet or Hot Dry Environment.
Technical rept.,
George F.Fonseca. Mar 81, 50p Rept no. USARIEM-T-2/81

The auxiliary cooling provided by five water-cooled undergarments was directly measured on a life-size, sectional manikin. Each water-cooled undergarment was worn with a combat vehicle crewman (CVC) ensemble, with or without a complete chemical protective (CB) suit. Cooling rates (watts) were determined for both dry (non-sweating) and completely wet (maximal sweating) skin conditions. The watts of heat removed from either the dry or the completely wet skin surface were found to be almost directly proportional to the temperature difference between the manikin skin temperature and the cooling water inlet temperature; the cooling represents the absorption of heat directly from the body, plus any heat that is received by the body from a hot environment. The cooling density, expressed in watts of cooling per square meter of cooling tube array, differed with the size of the array and with the location of the skin surface it covered. Comparison between the dry skin and the completely wet skin surface and the completely wet skin cooling rates showed a synergistic effect over those areas covered by a water-cooled undergarment; i.e. the total watts of cooling over a completely wet skin area (head, torso, etc.) minus the expected evaporative heat loss from the same skin area to the environment, were considerably greater than the watts of cooling when the skin was dry. (Author)

PB82-135575 PC **A02**/MF **A01**
Bureau of Mines, Pittsburgh, PA. Pittsburgh Research Center.
Protection Factors of the Airstream Helmet.
Rept. of investigations,
Andrew B. Cecala, Jon C. Volkwein, Edward D. Thimons, and Charles W. Urban. Oct 81, 23p BUMINES-RI-8591

The Bureau of Mines conducted laboratory and in-mine tests on the Racal airstream helmet (Model AH21) to evaluate its protection efficiency. Laboratory tests indicated that as ambient air velocity increased, the protection offered by the helmet decreased. In tests conducted at several coal mine longwall sections with face velocities under 400 fpm, the helmet was 84 pct effective at reducing respirable dust in the miner's breathing zone. However, at a high-velocity section, 1,200 fpm, the efficiency of the helmet was significantly reduced, confirming our laboratory results.

6R. Radiobiology

AD-A107 021/8 Not available NTIS
Texas Univ. Health Science Center at Dallas. Dept. of Physiology.
Computer-Based Operant Behavioral System for Microwave Bioeffects Research,
Robert M. Lebovitz, and Nathan A. Nicholes. 18 Sep 80, 9p
Contract N00014-79-C-0575, Grant PHS-FD-0824
Availability: Pub. in IEEE Transactions on Biomedical Engineering, vBME-28 n7 p536-543 Jul 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 023/4 Not available NTIS
Texas Univ. Health Science Center at Dallas. Dept. of Physiology.
Microwave Irradiation and Instrumental Behavior in Rats: Unitized Irradiation and Behavioral Evaluation Facility,
Robert M. Lebovitz, and R. L. Seaman. 20 Jun 80, 14p
Contract N00014-79-C-0575
Availability: Pub. in Bioelectromagnetics, v1 p415-428 1980 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 357/6 PC **A11**/MF **A01**
School of Aerospace Medicine, Brooks AFB, TX.
Proceedings of a Workshop on the Protection of Personnel against Radiofrequency Electromagnetic Radiation Held at the Royal Air Force Establishment, Farnborough, United Kingdom, 6-8 April 1981.
Technical rept.,
John C. Mitchell. Sep 81, 250p Rept nos. SAM-TR-81-28, SAM-REVIEW-3-81

These are the proceedings of a workshop convened to address new developments in the setting and application of RFR safety standards, assessment of RFR levels in the military environment, RFR instrumentation and dosimetry, the medical approach to specific problems, and important state-of-the-art research regarding the biological effects of long-term, low-level RFR exposures, pulsed versus continuous wave effects, and the effects of unique pulse modulations. The collected papers represent the contributions of various experts in the field from the NATO countries, brought together under the sponsorship of Research Study Group 2, Panel VIII, Defence Research Group, NATO, at the Royal Air Force Institute of Aviation Medicine, Royal Aircraft Establishment, Farnborough, U.K., 6-8 April 1981. (Author)

DE82000136 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
CRRIS: A Computerized Radiological Risk-Investigation System.
C. F. Baes, III, and C. W. Miller. 1981, 11p CONF-810905-10
Contract W-7405-ENG-26
ANS/ENS topical meeting on probabilistic risk assessment, Post Chester, NY, USA, 20 Sep 1981.

The US Environmental Protection Agency (EPA) is responsible for regulating radioactive airborne effluents in the US. A comprehensive, integrated Computerized Radiological Risk Investigation System (CRRIS) is being developed to support EPA's radiation standards development. This modular system consists primarily of five computer codes and their supporting data bases for estimating environmental transport and radiation doses and risks. Health effects are estimated on the basis of a life-table methodology developed by EPA. CRRIS is designed to provide EPA with a reasonable and flexible way of assessing the risk to man associated with radionuclide releases to the atmosphere. (ERA citation 06:035496)

LBL-10109 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Spermatogonial Stem Cell Renewal Following Irradiation.
J. I. Fabrikant. May 79, 11p CONF-790524-13
Contract W-7405-ENG-48
International congress symposium on radiation research and stem cells, Tokyo, Japan, 13 May 1979.

The spermatogonial cell renewal system can maintain function and a steady level of cell population for relatively long periods of continuous low-level irradiation indicating that there does not appear to be a serious accumulation, over many generations, of damage affecting proliferation. Provided the dose-rate is quite low, there is an effective selective removal of damaged cells with almost complete repair of cellular nonlethal damage. At dose-rates greater than 2 rad/day, spermatogonia are very sensitive to radiation death, and the main reason for the low tolerance to continuous stress could, in part, be the limited extent of compensatory mechanisms regulating spermatogonial cell production. However, there is some capacity to change the patterns of cellular proliferation while still remaining under homeostatic control, and this capacity appears to reside in the relatively radioresistant A/sub s/ stem-cell population. Little is known about the extent to which the spermatogonial cell population can repair nonlethal cellular radiation damage accumulated under continuous stress affecting the regenerative capacity of the tissue. After acute exposure, a minimum number of surviving type A/sub s/ stem-cells are required to repopulate the functional seminiferous epithelium, regeneration proceeds along an ordered cell stage sequence, and is dependent on the time required for all stages from type A/sub s/ spermatogonia to mature spermatozoa. Under continuous irradiation, provided the dose-rate is not too high, the repopulating ability of the seminiferous epithelium is maintained, in the presence of injury, due to initial repair and long-term repair of cellular radiation damage. There is evidence for initial repair, since a dose-rate effect exists in type A survival, at low doses. Long-term repair occurs due to differential radiosensitivities of spermatogonia. (ERA citation 05:012609)

ORO-2832-213 PC **A05**/MF **A01**
Texas Univ. System Cancer Center, Houston.
Radiation and Biophysical Studies on Cells and Viruses. Progress Report, September 1, 1979-June 15, 1980.
1980, 95p
Contract AS05-76EV02832

Research progress for the year 1979-1980 is reported for projects in damage and repair of genetic structures, and organization of genetic structures. (ERA citation 05:032836)

PB82-131517 PC **A02**/MF **A01**
Office of Radiation Programs, Washington, DC. Surveillance and Emergency Preparedness Div.
Baseline Study of Effects of Ionizing Radiation on the Chromosomes of the Marine Worm, 'Neanthes arenaceodentata'.
Technical note,
Gerald G. Pesch, and James S. Young. Sep 81, 19p ORP/SEPD-81-1
Also pub. as Environmental Research Lab., Narragansett, RI. Contrib. no. 198.

Between 1946 and 1970 the United States disposed of low level radioactive waste at several sites in the Atlantic and Pacific Ocean. In 1972 the Environmental Protection Agency was authorized under the Marine Protection Research and Sanctuaries Act (PL-92-532) to regulate all ocean disposal activities. This Act requires EPA to establish a program for reviewing and evaluating ocean dumping permit applications. Before EPA can approve permits for ocean dumping of radioactive waste, it will be necessary to determine how such wastes may affect marine biota. The purpose of this study was to test the feasibility of using a marine coastal worm, Neanthes arenaceodentata, as a cytogenetic model for assessing radiation damage to ocean organisms. Groups of worms were exposed to cobalt-60, then slide preparations were made and scored for gross chromosome aberrations and damage. All the levels of ionizing radiation tested from 180-680 rads were found to cause significant chromosome damage in N. arenaceodentata. The nature of this damage depended on dose, dose-rate and DNA repair capability of the worm. Worms responded to the same dose range as do mice. Since mice are accepted models for studying radiation effects on humans, this study supports the utility of using this species to study radiation effects on marine organisms.

6S. Stress Physiology

AD-A106 818/8 PC **A02**/MF **A01**
Army Aeromedical Research Lab., Fort Rucker, AL.
When the Grand Tour's a Grind,
Stanley C. Knapp. Sep 81, 14p Rept no. USAARL-81-2

Americans are traveling more and, in the view of many observers, enjoying it less. Modern jet travel, along with the necessity or desire to see as many tourist sights or conduct as many business meetings as possible in a single day, serve to create a well-defined but often overlooked symptom complex called travel stress. Travel stress is the complex interaction of a number of environmental, physiological, and psychological stressors. Disruptions in the traveler's circadian rhythm, changes in dietary habits, noise, vibration, pattern changes in the use of stimulants and alcohol, and the pressure of trying to get the most for one's travel dollar impact the health and efficiency of the traveler. This paper outlines proven and practical pre-travel prevention techniques and en route therapy. (Author)

AD-A106 852/7 PC **A02**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Prediction of Energy Expenditure during Load Carriage at High Altitude,
A. Cymerman, K. B. Pandolf, A. J. Young, and J. T. Maher. 19 Aug 80, 9p Rept no. USARIEM-M-29/80
Pub. in Jnl. of Applied Physiology, v51 n1 p14-18 1981. Supersedes AD-A092 361.

Group 6S—Stress Physiology

No abstract available.

AD-A107 004/4 Not available NTIS
Army Research Inst. of Environmental Medicine, Natick, MA.
Heat Balance and Transfer in Men and Women Exercising in Hot-Dry and Hot-Wet Conditions,
Yair Shapiro, Kent B. Pandolf, Barbara A. Avellini, Nancy A. Pimental, and Ralph F. Goldman. 12 Feb 81, 12p
Availability: Pub. in Ergonomics, v24 n5 p375-386 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 006/9 PC **A02**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Effect of Low Potassium Diet on Rat Exercise Hyperthermia and Heatstroke Mortality,
R. W. Hubbard, M. Mager, W. D. Bowers, I. Leav, and G. Angoff. 7 Jul 80, 10p Rept no. USARIEM-M-32/80
Pub. in Jnl. of Applied Physiology, v51 n1 p8-13 1981. Supersedes AD-A092 288.

No abstract available.

N82-11757/3 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Cyclic Nucleotides in Tissues During Long-Term Hypokinesia.
V. F. Makeyeva, G. S. Komolova, I. A. Yegorov, L. V. Serova, and N. A. Chelnaya. Oct 81, 6p NASA-TM-76726
Contract NASW-3541
Transl. Into English from "Tsiklicheskiye Nukleotidy V Tkanyakh Pri Dlitelnoy Gipokinezii", Voprosy Meditsinskoy Khimii (USSR), Vol. 27, No. 1, 1981 p 59-61. Transl. By Kanner (Leo) Associates, Redwood City, Calif. Original DOC. Prep. By Bakh Inst. Of Biochemistry, USSR.

Male Wistar rates were kept hypokinetic by placing them in small containers for 22 days. Blood plasma cAMP content was subsequently found increased, and cGMP content decreased, in the experimental animals. Liver and thymus cAMP content was similar in the control and experimental animals. There was a 20 and 38% decrease of cAMP content in the kidneys and spleen, respectively. Hypokinesia's reduction of cyclic nucleotides seems to inhibit RNA and protein synthesis.

N82-11759/9 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Electron Microscopical and Histochemical Studies on the Transverse Striated Muscles of Birds after Prolonged Hypokinesis.
M. Belak, J. Kocisova, J. Marcanik, K. Boda, and R. Skarda. Aug 81, 14p NASA-TM-76717
Contract NASW-3198
Transl. Into English from Arch. Exp. Veterinarmed. (Germany, D.R.). V. 33, No. 1, 1979 p 37-46. Transl. By Scientific Translation Service, Santa Barbara, Calif.

Studies of the gastrocnemius muscle were carried out in 4 month old cockerels of the laying hybrid after hypokinesis lasting 15 and 30 days. It was found that restricted movement resulted in dystrophic changes of myotibrils, enlargement of the sarcoplasmic reticulum and oedem of interfibrillar spaces. Histochemical studies revealed focuses of increased activity of non-specific esterase, decreased activity of dehydrogenase of lactic acid and a positive reaction of acid phosphatase.

N82-11760/7 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Participation of the Hypophyseal-Adrenal Cortex System in Thrombin Clearance During Immobilization Stress.
B. A. Kudryashov, A. M. Uljanov, F. B. Shapiro, and G. G. Bazazyan. Oct 81, 15p NASA-TM-76729
Contract NASW-3542
Transl. Into English from Folia Maematol. (Leipzig), V. 106, No. 2, 1979 p 244-253. Transl. By Scientific Translation Service, Santa Barbara, Calif. Original DOC. Prep. By State Univ. Of Moscow.

Thrombin marked with I-131 resulted in a considerable increase of the thrombined clearance rate in healthy male rats during stress caused by an immobilization lasting 30 minutes, and in an increase of thrombin clearance occurred by a combination of immobilization and administration of adrenocorticotropin (ACTH). Contrary to ACTH, the thrombin clearance is not stimulated in healthy animals by hydrocortisone. The results of the examination are presented.

N82-11771/4 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Effects of Curative Treatment Emphasizing Endurance Training on the Performance and Blood Pressure of Hypertensive and Normotensives.
F. Worms. Jun 81, 20p NASA-TM-76520
Contract NASW-3199
Transl. Into English from Dtsche. Gesundheitswesen, V. 35, No. 31, 1980 p 1207-1212. Transl. By Kanner (Leo) Associates, Redwood City, Calif.

The problem of normal values of blood pressure after exercise taking into account the blood pressure at the end of the exercise test is discussed. Hypertensives showed a lower working capacity than normotensives. In normotensives, however, systolic blood pressure at the end of an exercise correlated well with the working capacity. After the endurance cure submaximal blood pressure was markedly lower in hypertensives with a striking dependence on the level of initial values. Systolic blood pressure at the end of an exercise test was not changed significantly. Most probably it is not possible to overcome this malregulation in hypertensives by endurance training alone.

6T. Toxicology

AD-A106 944/2 PC **A02**/MF **A01**
Letterman Army Inst. of Research, Presidio of San Francisco, CA.
Primary Dermal Irritation Potential of the Insect Repellent CHF1 and Its Components.
Final rept.,
John T. Fruin, Martha A. Hanes, and Louis C. Rutledge. Sep 81, 23p Rept nos. LAIR-81-17TN, TOXICOLOGY-SER-7

The primary dermal irritation potential of CHF1 and its components was assessed by using the standard Draize test. The test called for approximately 0.5 ml of material to be held in contact with the skin of rabbits for 24 hours. CHF1 and its components were scored as mild irritants. (Author)

AD-A107 138/0 PC **A03**/MF **A01**
Grambling State Univ., LA.
Monitoring Calcium in Trout Eggs Exposed to Hydrazine.
Final rept. 1 Feb-1 Aug 81,
Vernon Henderson. 10 Jul 81, 33p AFOSR-TR-81-0654
Grant AFOSR-81-0079

This study was designed to determine if certain hydrazine-induced morphological abnormalities could be attributed to reduced levels of available calcium. Rainbow trout eggs (Salmo gairdneri) were exposed to 48 hours to 1.0, 2.0, 4.0, 6.0, and 8.0 mg/l of hydrazine. The responses to these concentrations were dose related. Eggs exposed to low concentration were less affected than those exposed to high concentration. Utilizing several staining techniques in combination with SEM, TEM and microelemental analysis, control muscle tissue showed a higher calcium level than healthy muscle of the 8.0 mg/l hydrazine treated group. Maldeveloped muscle of the 8.0 mg/l group showed a higher level of calcium than healthy muscle of the same individual. The notochord of the 8.0 mg/l group showed a higher calcium level than the control group. The chorion did not reveal a calcium level although structural modifications occurred in the treated groups which resulted in a softening. (Author)

AD-A107 204/0 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Reversal of Cholera Toxin-Induced Secretion in Rat Ileum by Luminal Berberine,
Edward A. Swabb, Yuan-Heng Tai, and Leila Jordan. 16 Dec 80, 7p
Pub. in American Jnl. of Physiology, v241 pG248-G252 1981.

No abstract available.

AD-A107 346/9 PC **A14**/MF **A01**
Midwest Research Inst., Kansas City, MO.
Identification or Development of Chemical Analysis Methods for Plants and Animal Tissues.
Final rept. 19 Aug 79-20 Oct 80,
Duane B. Lakings, and Owen Gan. Jan 81, 306p
DRXTH-TE-CR-80086
Contract DAAK11-79-C-0110

Studies have been conducted to define quantitative analytical methods for the determination of various munition compounds in biological matrices. The munition compounds evaluated included cyclotrimethylenetrinitramine (RDX), dinitrotoluene (DNT), trinitrotoluene (TNT), pentaerythrite tetranitrate (PETN), and 2, 4, 6-trinitrophenylmethylnitramine (tetryl). The biological matrices selected for study were animal plasma, kidney, muscle/fat, and liver and plant leaves and stems. The analytical methods were to be able to detect and quantitate the munition compounds at the 100 ng/g (parts per billion) level and were designed to utilize readily available analytical instrumentation, to be able to analyze a number of samples in a routine manner, and to be capable of providing the final results in a relatively short time. The developed methods may have application in assessing the environmental contamination of these munitions in the plants and animals at munition production facilities or in the immediate area. This report describes the research effort to develop the analytical methods for munition compounds in biological matrices.

AD-A107 381/6 PC **A02**/MF **A01**
Letterman Army Inst. of Research, Presidio of San Francisco, CA.
Primary Dermal Irritation Potential of Components of the M-258A-1 Decontamination Kit (Study 2).
Final rept.,
John T. Fruin, and Martha A. Hanes. Sep 81, 20p
Rept no. LAIR-81-21TN

The dermal irritation potential of components of the Prototype M-258A-1 Decontamination Kit was assessed by using a modified Draize test. The test called for applying the components to be wiped on the skin as they are intended to be applied under field conditions. Both components, Decon I and Decon II, when applied separately and together caused mild irritation after exposure and occlusion for 24 hr.

AD-A107 382/4 PC **A02**/MF **A01**
Letterman Army Inst. of Research, Presidio of San Francisco, CA.
Primary Dermal Irritation Potential of Components of the M-258A-1 Decontamination Kit (Study 4).
Final rept.,
John T. Fruin, and Martha A. Hanes. Sep 81, 20p
Rept no. LAIR-81-18TN

The primary dermal irritation potential of components of the Prototype M-258A-1 Decontamination Kit was assessed by using a modified Draize test. The test called for applying the components as they are intended to be applied under field conditions. Approximately 0.03 to 0.1 g of test substance was applied per dose site. Decon I and Decon I and II when applied together, caused moderate irritation after exposure and occlusion for 24 hours. Decon II caused mild irritation after exposure and occlusion for 24 hours. (Author)

ANL/BIM-79-1 PC **A04**/MF **A01**
Argonne National Lab., IL.
Review of Short-Term Screening Tests for Mutagens, Toxigens, and Carcinogens.
H. J. Carney, and B. S. Hass. Jul 79, 67p
Contract W-31-109-ENG-38

In order to test the thousands of man-made chemicals in the environment for carcinogenic and genetic hazards, a multitude of short-term screening tests has been developed to complement long-term mammalian bioassays and epidemiological studies. These tests cover a broad spectrum of organisms, and include the use of naked and viral nucleic acids, bacteria, fungi, higher plants, insects in vitro mammalian cell cultures (cell transformation, cell-mediated mutagenesis, DNA repair, and chromosome aberration tests) and live mammals. Assay end points include effects on nucleic acids, DNA repair synthesis, point or gene mutation, structural and numerical chromosome aberrations, cytological alterations, and in vitro cell transformation. The present review describes and compares these

assays. In addition, it discusses their historical development, the problems and limitations associated with their use, and their implementation in comprehensive testing programs. It is intended to provide overview and specific information to the laboratory that is in the process of establishing genetic toxicological systems. (The literature is reviewed to January 1978.). (ERA citation 04:055574)

DE81031985 PC **A06**/MF **A01**
Oak Ridge Associated Universities, Inc., TN.
Study of Protein Modifications Induced by Phorbol Ester Tumor Promoters in Mouse Skin.
K. G. Nelson. Aug 81, 104p DOE/TIC-11494
Contract AC05-76OR00033
Thesis. Submitted to the Univ. of Tennessee, Knoxville, TN.

The purpose of this study was to determine if the phorbol ester tumor promoter 12-0-tetradecanoylphorbol-13-acetate (TPA) induced any specific changes in mouse epidermal proteins using the high resolution technique of two-dimensional electrophoresis. To accomplish this goal of determining the specificity and possibly the stage in promotion with which these protein changes were associated, epidermal proteins were analyzed (1) after treatment of adult mouse epidermis with several weakly promoting hyperplasiogenic agents, (2) following treatment with TPA in combination with various inhibitors of tumor promotion, (3) in basal kerotinocytes isolated from adult epidermis following treatment with TPA or several weakly promoting agents, and (4) during an initiation-promotion experiment. Evidence was found which indicated that the potent tumor promoter TPA as well as the weakly promoting hyperplasiogenic agents, mezerein, ethylphenylpropiolate (EPP), and mechanical abrasion, induced similar modifications of epidermal proteins, particularly among the keratins. These keratin modifications progressed with time following treatment resulting in a keratin pattern which resembled that of newborn epidermis. (ERA citation 06:035519)

DE82000097 PC **A14**/MF **A01**
Oak Ridge National Lab., TN.
Review of Open Literature on Effects of Chlorine on Aquatic Organisms.
D. M. Opresko. Aug 80, 320p EPRI-EA-1491
Contract W-7405-ENG-26

The pre-1980 open literature on the chemistry and biological effects of chlorine in marine, freshwater, and estuarine systems is reviewed with special emphasis placed on the potential impacts of power plant chlorination practices. Information is provided on aqueous chlorine chemistry including the types and relative concentrations of residual oxidants formed under varying environmental conditions; the stability, persistence, and reactivity of these oxidants; and their potential for forming halogenated organic compounds. Analytical methods for differentiating and measuring chlorine-produced residual oxidants are discussed in a separate section. Information on biological effects, derived mainly from the results of laboratory bioassays, consists primarily of acute toxicity data, but also included are discussions of biological and environmental factors affecting species' tolerance levels; sublethal effects on reproduction, growth, behavior, and physiological processes such as respiration and osmoregulation; and possible mechanisms of oxidant toxicity at the cellular or biochemical level. The final chapter considers the relative efficiency and potential environmental impact of alternative chemical and physical methods for controlling biofouling in power plant cooling systems. (ERA citation 06:035521)

PB82-118894 PC **A04**/MF **A01**
Johns Hopkins Univ., Shady Side, MD. Aquatic Ecology Section.
Acclimation Temperature: An Important Factor Influencing the Interaction of Chlorine, delta T and Exposure Duration to Eggs, Prolarvae and Larvae of Striped Bass, 'Morone saxatilis',
Lenwood W. Hall, Jr., Stuart L. Margrey, and William C. Graves. Aug 81, 53p PPSP/PPRP-47

The effect of five acclimation temperatures on the interactions of total residual chlorine (TRC) (0.00, 0.15 and 0.30 mg/liter), delta T (2, 6, 10 C) and exposure duration (0.08, 2.0, 4.0 hours) conditions were evaluated for striped bass, Morone saxatilis, eggs, prolarvae and larvae. The range of acclimation temperatures (12.5, 15.0, 17.5, 20.0, 22.5 C for eggs and prolarvae; 15.0, 17.5, 20.0, 22.5 and 25.0 C for larvae) tested with each life stage included the lower, optimum and upper environmental temperatures that exist when these life stages may be subjected to power plant chlorination conditions. All organisms were tested using a fractional composite design in a 3 x 3 x 3 factorial matrix. Mortality of the eggs was highest at temperatures below 17.5 C; overall mortality decreased with increasing acclimation temperature. The factor causing the greatest effect with this developmental stage was T, followed by TRC and exposure time. Mortality of striped bass prolarvae increased with acclimation temperature after exposure to interacting treatment factors. Interactions involving TRC were most important from 12.5 to 17.5 C; delta T interactions were prominent at acclimation temperatures of 20.0 and 22.5 C. Larvae mortality was highest at 20 C with a gradual decrease at 25.0 C. Interactions involving delta T, TRC and exposure time all contributed to the mortality of this life stage; TRC and delta T caused the main effects. Striped bass eggs were the most resistent life stage; mean mortality averaged over all acclimation temperatures was approximately the same for prolarvae and larvae.

PB82-128158 PC **A02**/MF **A01**
Montana State Univ., Bozeman. Fisheries Bioassay Lab.
Effect of Fluctuating Exposures on the Acute Toxicity of Ammonia to Rainbow Trout (Salmo gairdneri) and Cutthroat Trout (S. clarki).
Journal article,
Robert V. Thurston, Charles Chakoumakos, and Rosemarie C. Russo. Oct 81, 7p EPA-600/J-81-345
Pub. in Water Research, v15 p911-917 1981.

Acute toxicity bioassays in which fish were exposed to short-term cyclic fluctuations of ammonia were conducted on rainbow trout (Salmo gairdneri) and on cutthroat trout (S. clarki). Companion tests were also conducted in which test fish were subjected to ammonia at constant concentrations. The tests ranged in duration from 96 h to 4 weeks. Median lethal concentration (LC50) values in terms of both average and peak concentrations of ammonia for the fluctuating concentration tests were compared with LC50 values for the constant concentration (conventional) tests. Based on comparisons of total dose exposure, results showed that fish were more tolerant of constant concentrations of ammonia than of fluctuating concentrations. Fish subjected to fluctuating concentrations of ammonia at levels below those acutely toxic were subsequently better able to withstand exposure to higher fluctuating concentrations that fish not previously so acclimated.

PB82-133638 PC **A08**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Pesticides and Toxic Substances.
Dialifor (O, O-diethyl S-(2-chloro-1-phthalimidoethyl) phosphorodithioate): Pesticide Registration Standard.
Aug 81, 175p EPA-540/RS-81-014

This document contains information regarding reregistration of pesticide products containing O,O-diethyl S-(2-chloro-1-phthalimidoethyl) phosphorodithioate (Dialifor), including how to register under a registration standard, regulatory position and rationale, and summaries of data requirements and data gaps. Also included is a bibliography containing citations of all studies reviewed by EPA in arriving at the positions and conclusions contained in the standard.

PB82-137654 PC **A02**/MF **A01**
Environmental Research Lab., Gulf Breeze, FL.
Initial Toxicological Assessment of Ambush, Bolero, Bux, Dursban, Fentrifanil, Larvin, and Pydrin: Static Acute Toxicity Tests with Selected Estuarine Algae, Invertebrates, and Fish.
Rept. for May 79-Aug 81,
Patrick W. Borthwick, and Gerald E. Walsh. Sep 81, 13p EPA-600/4-81-076

Selected static toxicity tests were conducted with Ambush, Bolero, Bux, Dursban, Fentrifanil, Larvin, and Pydrin to determine the sensitivity of species representing four major phyla. Algal bioassays were conducted with marine algae to determine the concentration of pesticide that would inhibit population growth by 50% in 96 h. Static toxicity tests with mollusk larvae estimated the concentration of pesticide that would cause 50% of the exposed larvae to develop abnormally in 48 h. Static acute lethality tests with crustaceans and fish determined the concentration of pesticide that is lethal to 50% of the test organisms during a 96-h exposure.

7.

CHEMISTRY

7A. Chemical Engineering

COO-5066-T12(V.1) PC **A25**/MF **A01**
McKee (Arthur G.) and Co., Cleveland, OH.
Fuel Gas Demonstration Plant Program: Small-Scale Industrial Project. Demonstration Plant Design Manual, Phase I.
Jan 79, 594p
Contracts ET-78-C-01-2578, EW-78-C-02-5066

The plant will utilize fixed bed, stirred, two stage gasifiers. The lower stage will be a standard gasifier configuration. The upper stage will be an undivided distillation section containing a slowly rotating stirrer which will move vertically through the bed. The bottom of the gasifier will contain a standard dry grate and will have lock hoppers to discharge the ash. This type of gasifier provides high coal utilization. It also distills the tars and oils from the coal in the upper zone at minimum temperatures, thereby providing minimum viscosity liquid fuels which can be used for the induration of iron ore pellets. The very hot bottom gases leaving the combustion zone, after passing through a cyclone to remove coal and ash dust can be used to generate steam. This steam is in addition to the steam generated in the water jacket of the lower zone which is used in the steam air blast to the bottom of the gasifier retort. (ERA citation 05:019918)

COO-5066-T12(V.2) PC **A15**/MF **A01**
McKee (Arthur G.) and Co., Cleveland, OH.
Fuel Gas Demonstration Plant Program: Small-Scale Industrial Project. Demonstration Plant Design Manual, Phase I.
Jan 79, 343p
Contracts ET-78-C-01-2578, EW-78-C-02-5066

No abstract available.

DE81031937 PC **A05**/MF **A01**
Pittsburg and Midway Coal Mining Co., Englewood, CO.
Solvent-Refined Coal (SRC) Process. Final Report.
Aug 81, 87p DOE/ET/10104-12
Contract AC05-76ET10104

In late 1979 the Pittsburg and Midway Coal Mining Co. (P and M), recommended to the Department of Energy (DOE) that certain areas of the SRC Pilot Plant should be modified to represent the SRC-II Demonstration Plant design. The proposed modifications were for design confirmation; start-up, transient and other operational guidance studies; and training of operator and professional personnel. The pilot plant facilities proposed for modification were: Coal Slurry Mixing - Area 01; Dissolver Effuent Cooling and Separation - Area 02; and Vacuum Flash/Residue Pump Testing - Area 04. A summary justification assessment for the modifications is included. A preliminary engineering study by Badger Energy, Inc. (BEI) was completed in late 1980. A proposal to begin detailed engineering had been submitted to DOE for approval when all work was discontinued at the direction of the DOE in April 1981. (ERA citation 06:034206)

DE82000420 PC **A07**/MF **A01**
Southern Co. Services, Inc., Birmingham, AL.
Solvent Refined Coal Process: Operation of the Solvent Refined Coal Pilot Plant, Wilsonville, Alabama. First Quarter Report, January-March 1981.
H. E. Lewis. 1981, 142p DOE/ET/10154-T16, FE-2270-88
Contract AC22-76ET10154

This report summarizes the operating conditions and test results obtained during the first quarter of 1981 at the six ton per day solvent refined coal (SRC-I) pilot plant in Wilsonville, Alabama. The plant operated for

approximately two-thirds of the period with a scheduled shutdown, from 22 February to 17 March, accounting for most of the downtime. Kentucky 9 coal from the Fies mine was processed throughout the period. The following potential process improvements and tests were evaluated in the respective process units. SRC Unit: Low severity run tests to evaluate SRC reactor conditions for two-stage liquefaction; process solvent quality studies while simulating demonstration plant conditions with low quality process solvent (anthracene oil); operation of the new, reduced volume and residence time, V103 High Pressure Separator; Evaluation of the hot separator mode of operation; and adjustment of the T102 Vacuum Column operation to determine if it can produce a combined trays 3 and 8 stream that would be an acceptable process solvent (95% boiling at over 450 exp 0 F). CSD Unit: Steam stripping of SRC and LSRC to reduce product-related DAS losses; and ambient and cryogenic SRC sampling comparisons for DAS determination tests. Pressure checking of the hydrotreater unit was completed, and the Dowtherm system was placed in service. Solvent circulation was initiated in the unit as efforts continued to verify equipment performance. (ERA citation 06:034207)

DE82000432 PC **A03**/MF **A01**
Department of Energy, Morgantown, WV. Morgantown Energy Technology Center.
Fixed-Bed Gasification.
Jan 81, 29p DOE/METC/SP-184

Since the completion of construction in 1967, the METC Gasifier Pilot Plant has produced data and demonstrated operation on all major ranks of US coals. In 1976, METC began an expansion program to include a novel gas-cleanup facility to evaluate the environmental problems associated with gasification plants and also to develop improved cleanup systems. The construction and checkout of this full-scale cleanup system was completed within the past year and the pilot-plant facility now has the capability of gasifying all US coals and producing a relatively tar-, oil-, particulate-, and sulfur-free fuel gas. The Department of Energy's (DOE) fixed-bed gasification development program includes other facilities that provide DOE with a broad capability to address alternative- and advanced-gasification technologies. In addition to utilizing these facilities to evaluate and improve gasification/cleanup-system configurations, the pilot plants are also being used to support a number of related projects. (ERA citation 06:034211)

DOE/ET/10069-T1(V.2) PC **A19**/MF **A01**
Exxon Research and Engineering Co., Florham Park, NJ.
EDS Coal-Liquefaction Process Development. Phase V. EDS Commercial Plant Study Design Update: Illinois Coal. Volume 2. Base Case.
W. R. Epperly. Mar 81, 435p FE-2893-61(V.2)
Contract AB01-77ET10069
U.S. Sales Only.

This report is Volume 2 - Base Case of the EDS Commercial Plant Study Design Update. The complete documentation (Executive Summary plus Volumes 1, 2 and 3) covers the conceptual, or study design of an Exxon Donor Solvent (EDS) Coal Liquefaction Commercial Plant feeding Illinois No. 6 bituminous coal. The EDS process directly converts coal to a range of clean hydrocarbon products by contacting the coal with hydrogen in the presence of a hydrogenated solvent at about 840 exp 0 F and 2000 psi. Potential process improvements conceived after the design basis was set in 1978, such as liquefaction bottoms recycle and direct combustion of liquefaction bottoms, are not reflected here. Entitled the Study Design Update (SDU), this conceptual design is a complete update of an earlier, less extensive study design prepared in 1975/1976. The SDU was started in 1977, and technical work was completed in 1979; about 245 engineer-months of effort were expended. The objectives of the SDU were to identify the technical issues facing a potential commercial-size EDS plant design, to provide a reliable basis for estimating the cost of EDS products, and to furnish research guidance to the EDS Project. Also, the SDU was to provide a firm starting point for initial commercialization studies of a future pioneer liquefaction plant. These objectives were achieved. Volume 2 of the EDS Commercial Plant Study Design Update report covers process details of the Base Case design (steam reforming for hydrogen/FLEXICOKING for fuel). Design information for each process block (e.g., liquefaction) is given in the individual attachments. Process flow schemes heat and material balances, and equipment specifications are included. (ERA citation 06:019629)

DOE/ET/10069-T1(V.3) PC **A11**/MF **A01**
Exxon Research and Engineering Co., Florham Park, NJ.
EDS Coal-Liquefaction Process Development. Phase V. EDS Commercial Plant Study Design Update: Illinois Coal. Volume 3. Market Flexibility Sensitivity Case.
W. R. Epperly. Mar 81, 229p FE-2893-61(V.3)
Contract AB01-77ET10069
U.S. Sales Only.

This report is Volume 3 - Market Flexibility Sensitivity Case of the EDS Commercial Plant Study Design Update. The complete documentation (Executive Summary plus Volumes 1, 2 and 3) covers the conceptual, or study design of an Exxon Donor Solvent (EDS) Coal Liquefaction Commercial Plant feeding Illinois No. 6 bituminous coal. The EDS process directly converts coal to a range of clean hydrocarbon products by contacting the coal with hydrogen in the presence of a hydrogenated solvent at about 840 exp 0 F and 2000 psi. Potential process improvements conceived after the design basis was set in 1978, such as liquefaction bottoms recycle and direct combustion of liquefaction bottoms, are not reflected here. Entitled the Study Design Update (SDU), this conceptual design is a complete update of an earlier, less extensive study design prepared by the EDS Project in 1975/1976. The SDU was started in 1977, and technical work was completed in 1979; about 245 engineer-months of effort were expended. The objectives of the SDU were to identify the technical issues facing a potential commercial-size EDS plant design, to provide a reliable basis for estimating the cost of EDS products, and to furnish research guidance to the EDS Project. Also, the SDU was to provide a firm starting point for initial commercialization studies of a future pioneer liquefaction plant. These objectives were achieved. Volume 3 covers process details of the Market Flexibility Sensitivity Case design (partial oxidation for hydrogen/FLEXICOKING for fuel). Design information for each process block (e.g., hydrogen recovery and generation) is given in the individual attachments. Process flow schemes, heat and material balances, and equipment specifications are included. (ERA citation 06:019630)

DOE/ET/10069-T7(V.1) PC **A04**/MF **A01**
Exxon Research and Engineering Co., Florham Park, NJ.
EDS Coal-Liquefaction Process Development. Phase V. Monthly Technical Progress Report, March 1-March 31, 1981.
May 81, 53p FE-2893-69(V.1)
Contract AB01-77ET10069
U.S. Sales Only.

A simplified model for coal conversion is being formulated. In this new approach fewer model parameters were used while preliminary results showed correlation of the RCLU data base to be equally as good as the earlier model. A solvent hydrogenation simulation study is being conducted to support recommendations of hydrotreating conditions for ECLP which should result in an improvement in solvent quality. Preliminary results indicate that less severe solvent hydrotreating conditions will result in lower saturates production rates and be beneficial in improving solvent quality. EDS distillate will be tested as a rich/lean utility gas turbine fuel in an EPRI sponsored United Technologies program, and a combined liquid product from Big Brown lignite will be upgraded by Chevron in a DOE sponsored program. Seven-and-one-half tons of vacuum bottoms were loaded and shipped for grinding. This material will be used for testing at the Shell Partial Oxidation Pilot Plant in Amsterdam. Vacuum bottoms totaling 135 tons were shipped to Texaco in California for partial oxidation testing. Industrial Hygiene sampling is continuing in two particular areas: (1) monitoring of Mechanical personnel when they are performing maintenance on pumps; and (2) area sampling around the atmospheric bottoms pumps and the vacuum bottoms cooling belt. (ERA citation 06:023000)

DOE/ET/10069-T7(V.2) PC **A02**/MF **A01**
Exxon Research and Engineering Co., Florham Park, NJ.
EDS Coal-Liquefaction Process Development. Supplemental FLEXICOKING/Sup SM/ Development Program. Monthly Technical Progress Report, March 1-March 31, 1981.
May 81, 24p FE-2893-69(V.2)
Contract AB01-77ET10069
U.S. Sales Only.

A study to assess the feasibility of the EDS-FPU processing Illinois once through vacuum bottoms with higher-than-design quantities of flux to over-come feed circuit viscosity limitations was completed. As previously reported, the two flux levels studied (35% and 100% flux on vacuum bottoms) could be processed in the EDS-FPU without a reduction in the design vacuum bottoms rate by adjusting several operating conditions/modes (i.e., gasifier temperature, air to heater, recycle coking). Based on the current laboratory data for ECLP bottoms produced to date, 35% flux on vacuum bottoms should be sufficient to overcome viscosity limitations in the EDS-FPU feed circuit. Therefore, it was recommended that at this time no design changes to the EDS-FPU be made to accommodate 100% fluxing of Illinois once-through vacuum bottoms. ECLP and the ERE Laboratory at Baytown are continuing analyses of existing ECLP vacuum bottoms and will monitor present production daily for melting point and viscosity changes. The impact of these analyses on the results of this study will be reviewed as necessary. Work is continuing on the preparation of an expanded Design Basis Specification for the low Btu (LBG) cleanup facilities for the FLEXICOKING Prototype Unit (FPU). It has been verified that an existing amine scrubber tower at the FPU site has an adequate number of trays and is of the proper diameter to reduce contaminant concentrations to the desired levels in the LBG generated from any of the three FLEXICOKING operations described. A review of the existing EDS-FPU gasifier grid cap design has resulted in a modification of the grid cap. (ERA citation 06:023001)

FE-2577-1(V.2) PC **A21**/MF **A01**
Grace (W.R.) and Co., Memphis, TN.
Demonstration Plant Process and Conceptual Mechanical Design. Volume II. Synthesis Gas Demonstration Plant Program, Phase I.
Sep 79, 489p
Contract EF-77-C-01-2577

The engineering effort for the Demonstration Plant resulted in the developments of an equipment index, process duty specification sheets, plant arrangement drawings, and a scale model. This section includes these documents as well as the site and plot plans, a description of storage facilities, and a description of the plant communication system. (ERA citation 05:017333)

FE-2582-13 PC **A17**/MF **A01**
Memphis Light, Gas and Water Div., TN.
Industrial Fuel Gas Demonstration Plant Program. Task II Report, Demonstration Plant Process Design. 2ND Issue.
Oct 79, 381p
Contract EF-77-C-01-2582

This Design Basis, initially issued March 4, 1979 forms the foundation for process and mechanical engineering of the demonstration plant. Included in the Basis of Design are the plant capacity, coal analysis, product gas specifications, unit material balance around the gasifiers, design parameters for various plant areas. This plant is designed to gasify coal and produce a clean medium Btu Industrial Fuel Gas (IFG). Sulfur in the coal is recovered and bright liquid sulfur produced. The plant is designed for a net IFG production of 50 x 10 exp 9 Btu/day. The plant is designed to produce only IFG and sulfur. No other by-products were considered in the Phase I demonstration plant design. The plant is designed for operation at a 90% on-stream factor, excluding credit generation. Sufficient spare equipment is provided to allow the plant to achieve the 90% factor. This includes, but is not limited to, rotating equipment; large centrifugal compressors may have spare rotors only. A distinction was made between equipment items with installed spares and items for which plot space is left vacant for a possible spare, to be installed if found necessary. The plant is designed to operate at a net IFG production of 15 x 10 exp 9 Btu/day through the Credit Generation System. The product gas specifications to the IFG pipeline was maintained at all levels of operation between 100% and 33-1/3% of the plant material balance. The plant

is designed to operate on the representative coal described. Other coals may be used in the plant in the future. The coal feed rate will then be adjusted to fit the capacities of the various units in the plant. (ERA citation 05:014665)

N82-11146/9 PC **A09**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Assessment of Advanced Coal Gasification Processes.
J. Mccarthy, J. Ferrall, T. Charng, and J. Houseman.
Jun 81, 200p NASA-CR-164949, JPL-PUB-81-45
Contracts NAS7-100, DE-AI21-77ET-13032
Sponsored in Part by Doe and JPL.

A technical assessment of the following advanced coal gasification processes is presented: high throughput gasification (HTG) process; single stage high mass flux (HMF) processes; (CS/R) hydrogasification process; and the catalytic coal gasification (CCG) process. Each process is evaluated for its potential to produce synthetic natural gas from a bituminous coal. Key similarities, differences, strengths, weaknesses, and potential improvements to each process are identified. The HTG and the HMF gasifiers share similarities with respect to: short residence time (SRT), high throughput rate, slagging, and syngas as the initial raw product gas. The CS/R hydrogasifier is also SRT, but is nonslagging and produces a raw gas high in methane content. The CCG gasifier is a long residence time, catalytic, fluidbed reactor producing all of the raw product methane in the gasifier.

ORO-3054-T3(App.G) PC **A18**/MF **A01**
Southern Co. Services, Inc., Birmingham, AL.
SRC-I Coal Refinery. Task 1, Appendix G. General Construction Specifications.
31 Jul 79, 404p
Contract ET-78-C-05-3054

This volume contains engineering specifications which define materials and workmanship for bulk commodities of construction work. (ERA citation 05:012970)

PB82-134792 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
Application of the Method of Inequalities to the Multivariable Control of Binary Distillation Columns,
O. Taiwo. Jan 79, 36p CONTROL SYSTEMS CENTRE-442

The method of inequalities is used to design controllers for dual quality control of four binary distillation columns whose top and bottom compositions are controlled by manipulating reflux rate and steam. Two types of multi-variable proportional-plus-integral controllers are designed and the performance of the system with these controllers is compared with that of non-interacting control. The results of implementing the simpler controller, which is represented by a diagonal matrix, on a computer-controlled packed distillation column are also presented.

PB82-136102 PC **A04**/MF **A01**
Midwest Research Inst., Kansas City, MO.
Chemical Technology and Economics in Environmental Perspective. Task VI - A Survey of Plasticizers: Epoxies, Linear Polyesters, and Trimellitates.
Final rept.,
Thomas W. Lapp, Charles E. Mumma, and Joseph Chaszar. Nov 81, 74p 4441-T(6), EPA-560/2-81-006
Contract EPA-68-01-3896
See also PB-266 181.

Study investigated the published literature for selected areas in three classes of plasticizers: epoxies, linear polyesters, and trimellitates. Areas of interest included physical and chemical properties, production and use, health and environmental effects, and plasticizer interchangeability. Current production methods, sites, and annual volumes are presented for each class. Little information is available in the published literature on health effects. No occupational standards exist for any of the three classes. Unpublished health data are available for selected tests from manufacturers for specific materials. Environmental effects were limited to static fish toxicity studies for two trimellitates and studies of fungal and bacterial growth with epoxies and linear polyesters. Both classes of plasticizers are very susceptible to fungal and bacterial attack.

PB82-802661 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Waste Processing and Pollution in the Chemical and Petrochemical Industries. 1978-June, 1980 (Citations from the NTIS Data Base).
Rept. for 1978-Jun 80.
Dec 81, 286p

These citations from Federally funded research cover many aspects of waste processing and pollution in the chemical and petrochemical industries. The bibliography includes emissions, economics, control processes, pollution effects, and abatement strategies. (This updated bibliography contains 280 citations, none of which are new entries to the previous edition.)

PB82-802679 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Waste Processing and Pollution in the Chemical and Petrochemical Industries. July, 1980-November, 1981 (Citations from the NTIS Data Base).
Rept. for Jul 80-Nov 81.
Dec 81, 127p
Supersedes PB80-813306, and NTIS/PS-79/0877.

These citations from Federally funded research cover many aspects of waste processing and pollution in the chemical and petrochemical industries. The bibliography includes emissions, economics, control processes, pollution effects, and abatement strategies. (This updated bibliography contains 121 citations, all of which are new entries to the previous edition.)

PB82-802737 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Pollution Caused by Ammunition Manufacturing. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 277p
Supersedes PB80-814478, and NTIS/PS-79/0923.

The bibliography covers air, water, and solid pollution produced by munition plants. The citations include monitoring, chemical analysis, cost analysis, pollution control techniques, equipment used, and toxicity studies. (This updated bibliography contains 270 citations, 17 of which are new entries to the previous edition.)

PB82-858499 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Molecular Sieves. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 224p
Supersedes PB81-853707. Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography covers applications of molecular sieve technology and techniques in processes and systems chiefly in the energy industry for producing fuels and processing wastes. Consideration is also given to the design, preparation, characteristics, and performance of molecular sieves or sieve materials. (This updated bibliography contains 217 citations, 28 of which are new entries to the previous edition.)

PB82-858507 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Molecular Sieves. 1970-1981 (Citations from the NTIS Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 145p
Supersedes PB81-853699.

Citations in this bibliography cover theoretical and experimental considerations of the structure, properties, and performance of molecular sieves or sieve materials. A wide variety of applications of molecular sieves to separation processes and to purification are also covered. (This updated bibliography contains 110 citations, 21 of which are new entries to the previous edition.)

7C. Organic Chemistry

AD-A107 224/8 Not available NTIS
Colorado State Univ., Fort Collins. Dept. of Chemistry.
Chemistry of Aryloxazolines. Applications to the Synthesis of Lignan Lactone Derivatives,
A. I. Meyers, and Walter B. Avila. 13 Apr 81, 7p
ARO-16365.4-C
Contract DAAG29-79-C-0061
Availability: Pub. in Jnl. of Organic Chemistry, v46 n19 p3881-3886 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 242/0 PC **A02**/MF **A01**
Army Medical Bioengineering Research and Development Lab., Fort Detrick, MD.
Competitive Pathways in Chlorine Dioxide Oxidation of Amines: Amide Formation from Acyclic Amines.
Final rept. Oct 80-Sep 81,
Elizabeth P. Burrows, and David H. Rosenblatt. Oct 81, 12p Rept no. USAMBRDL-TR-8109

Treatment of dibenzylamine and ethyl N,N-dibenzylglycinate with chlorine dioxide ($C1O_2$) gave, in addition to the expected products of oxidative dealkylation, substantial amounts of amides. With the second reaction and preformed $C1O_2$ at pH 4-7, ethyl N,N-dibenzyloxamate was the predominant isomer; however, with $C1O_2$ generated in situ at pH 2.5-3, ethyl N-benzoyl-N-benzyl glycinate was predominant. In the latter case the combined yield of amides was sufficiently high (80%) to be of synthetic utility. (Author)

AD-A107 457/4 PC **A03**/MF **A01**
Virginia Univ., Charlottesville. Dept. of Chemistry.
Pentamethylcyclopentadienyl Cobaltaboranes Derived from the $B5H8^{(-)}$ and $B9H14^{(-)}$ Ions: Studies in Synthesis and Structure.
Interim technical rept.,
T. Leon Venable, and Russell N. Grimes. Nov 81, 49p Rept no. TR-38
Contract N00014-75-C-0305

The reactions of of $B5H8^{(-)}$ and $B9H14^{(-)}$ ions (both generated from B5H9 and NaH in THF solution under different conditions) with CoCl2 and $Li^{(+)}(C5(CH3)5)^{(-)}$ in THF, were examined. The two reaction systems generate entirely different cobaltaborane products, which were isolated as air-stable, colored crystalline solids and characterized by B11 and H1FT NMR spectroscopy at 115.5 and 360 MHz, respectively, and by unit- and high-resolution mass spectrometry, infrared spectra, and (in five cases) by X-ray diffraction studies. From the $B9H14^{(-)}$ reaction four products were characterized, all of which are 10-vertex CoB9 or $Co2B8$ nido cages analogous to B10H14; the major species, 6-(C5(CH3)5)CoB9H13, was obtained in 25% yield. Minor products were 6,9-(C5(CH3)5)2Co2B8H12'5,7-(C5(CH3)5)2CoB8H12, and the 6-chloro derivative of the latter compound. The $B5H8^{(-)}$ reaction generates a larger and structurally more diverse series of products, none in greater than 5% yield. The major products obtained after a 2-hr reaction period at room temperature are 2-(C5(CH3)5)CoB4H8, 1,2-(C5(CH3)5)2Co2B4H6, and 1,2,3-(C5(CH3)5)3Co3B4H4 all of which are analogous to cyclopentadienyl complexes obtained in the reaction of $B5H8^{(-)}$ with CoCl2 and C5H5C5H--5 reported earlier.

AD-A107 498/8 PC **A04**/MF **A01**
SRI International, Menlo Park, CA.
Synthesis of Energetic Polymers.
Summary rept. 15 Jul 80-14 Jul 81,
G. E. Manser, and Donald L. Ross. 15 Oct 81, 60p Rept no. SRI-8627
Contract N00014-79-C-0525

Three general synthetic routes to the preparation of energetic oxetanes and tetrahydrofurans were investigated during the first year of the program. Subsequently, 3-(2-fluoro-2,2-dinitroethyl-3-methyloxetane (FOE) was prepared and polymerized to give oligomers with molecular weights ranging from 6,000 to 15,000. Efforts to develop a general synthetic route to 3-nitroalkyl substituted oxetanes starting with methylene malonate were not successful. However, work on an alternative general route to oxetanes afforded oxetane 3,3-diacetic acid in low yield This material could be used to prepare a series of nitro esters of oxetane, but this

work was terminated as our experience has shown that cationic polymerization of esters does not produce significant conversion of the monomer. Work on a general route to nitroalkyl-substituted tetrahydrofurans resulted in 3-(2,2-dinitropropyl)tetrahydrofuran (3-DNPTHF), which was prepared using a synthetic route of general applicability to other 3-substituted tetrahydrofurans. A preliminary polymerization study yielded dimer and trimer, suggesting that polymerization was possible.

PB82-859182 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Photopolymerization. 1970-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 115p
Supersedes PB81-855835.

This bibliography contains citations concerning photopolymerization of various materials. Among the materials examined are catalyzed and uncatalyzed polymers, monomers, and composite materials. Photopolymerization for thermal transfer printing on textiles, elimination of oxygen in photopolymerization processes, photopolymerization energy requirements, and calorimetric analysis of photopolymerizations are included. (This updated bibliography contains 105 citations, 10 of which are new entries to the previous edition.)

7D. Physical Chemistry

AD-A106 854/3 PC **A02**/MF **A01**
IBM Thomas J. Watson Research Center, Yorktown Heights, NY.
Lifetime Broadening of Excited Pyrazine Adsorbed on Ag(111).
Technical rept.,
J. E. Demuth, and Ph. Avouris. 6 May 81, 10p Rept no. TR-16
Contract N00014-77-C-0366
Pub. in Physical Review Letters, v47 n1 p61-63, 6 Jul 81.

No abstract available.

AD-A106 928/5 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Chemistry.
Electrostatic Binding of Electroactive and Non-Electroactive Anions in a Surface-Confined, Electroactive Polymer: Selectivity of Binding Measured by Auger Spectroscopy and Cyclic Voltammetry.
Interim technical rept.,
James A. Bruce, and Mark S. Wrighton. 15 Sep 81, 48p Rept no. TR-30-ONR
Contract N00014-75-C-0880

Electrodes derivatized with electroactive polymers or with charged, nonelectroactive polymers can be significantly influenced by the nature of the electrolyte and other ions present in a solution contacted by the derivatized electrode. It has been shown that charged, nonelectroactive polymers can persistently bind significant quantities of charged, electroactive species such as Fe(CN)(6)(4-) by surface polyvinylpyridinium or Ru(bipyridine)(3)(2+) by Nafion. Theses examples illustrate how electrostatic binding may be exploited for anlaysis, preparation of a variety of modified electrodes, and study of electrocatalysis. Electroactive polymers are charged in at least one of their accessible redox states and both selectivity of counterion binding and the movement of ions in and out of the surface polymer associated with change of redox state may affect electrochemical behavior. Electrodes coated with electroactive polymers may have a number of uses, including desalting of H20, that depend on the behavior of solution ions.

AD-A106 938/4 PC **A02**/MF **A01**
Howard Univ., Washington, DC. Dept. of Chemistry.
Model Analysis of the Raman Spectrum from Fused Silica Optical Fibers.
Technical rept.,
G. E. Walrafen, and P. N. Krishnan. Oct 81, 12p Rept no. TR-5
Contract N00014-80-C-0305

The Raman spectrum from pure silica optical fibers has been analyzed into a set of Gaussian components. Each component used is related to an observed feature of the spectrum, and a residual of about 1% resulted without the use of additional components. Both single- and multi-phonon peaks were fitted. These Gaussian components have analog in the infrared absorption spectrum, and hence they are of value in studying the fundamental and overtone infrared absorption of silica, as well as the infrared OH overtone and combination spectra. (Author)

AD-A106 963/2 PC **A02**/MF **A01**
California Univ., Irvine. Dept. of Chemistry.
Symmetry Extinction of LEED Beams for Naphthalene Adsorbed on Pt(III).
Technical rept.,
David Dahlgren, and John C. Hemminger. 1 Sep 81, 19p Rept no. TR-1
Contract N00014-79-C-0648

The LEED pattern obtained for Naphthalene on Pt(III) is well described by an ordering which consists of three equivalent domains of a (6x3) overlayer. The existence of a glide symmetry in the overlayer is confirmed by the angular dependence of the symmetry extinction of several LEED beams. (Author)

AD-A106 964/0 PC **A02**/MF **A01**
Pennsylvania Univ., Philadelphia.
Solitons in Polyacetylene: Effects of Dilute Doping on Optical Absorption Spectra.
Technical rept.,
N. Suzuki, M. Ozaki, S. Etemad, A. J. Heeger, and A. G. MacDiarmid. 9 Jun 80, 9p Rept no. TR-81-6
Contract N00014-81-K-0648
Pub. in Physical Review Letters, v45 v14 p1209-1213, 6 Oct 80.

No abstract available.

AD-A106 969/9 PC **A02**/MF **A01**
Royal Aircraft Establishment, Farnborough (England).
Applications of the Microscan 9 Microanalyser.
Technical memo.,
P. D. Pitcher. Jan 81, 19p RAE-TM-MAT-358, DRIC-BR-77779

The basic principles of electron microprobe analysis are outlined, and the essential features of the Microscan 9 instrument described. Applications of the M9 are illustrated by means of practical examples. (Author)

AD-A107 016/8 Not available NTIS
Battelle Columbus Labs., OH.
Formaldehyde: Electronic Structure Calculations for the S(0) and T(1) States,
George F. Adams, Gary D. Bent, Rodney J. Bartlett, and George D. Purvis. 4 Jun 80, 10p ARO-16929.2-P
Contract DAAG29-80-C-0105
Availability: Pub. in Jnl. of Chemical Physics, v75 n2 p834-842, 15 Jul 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 017/6 Not available NTIS
SRI International, Menlo Park, CA. Molecular Physics Lab.
Two-Photon Laser-Induced Fluorescence in Oxygen and Nitrogen Atoms,
William K. Bischel, Bryce E. Perry, and David R. Crosley. 8 May 81, 5p ARO-17416.2-C
Contract DAAG29-80-K-0049
Availability: Pub. in Chemical Physics Letters, v82 n1 p85-88, 15 Aug 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 067/1 PC **A02**/MF **A01**
California Univ., Irvine. Dept. of Chemistry.
The Nature of the Phase Transition Observed for Monolayers of Azulene on Pt(III).
Interim rept.,
David Dahlgren, and John C. Hemminger. 1 Oct 81, 16p Rept no. TR-2
Contract N00014-79-C-0648

A model is presented for the reversible phase transition observed for azulene monolayers on Pt(III). Below the transition temperature the overlayer LEED pattern consists of (3x3) aligned with the substrate and (3x3) rotated by 30 degrees. Above the transition temperature the LEED pattern is a (3x3) aligned with the substrate. The model attributes the phase transition to an order-disorder transition of the rotational orientation of azulene molecules with the molecular plane parallel to the surface. (Author)

AD-A107 068/9 PC **A03**/MF **A01**
California Univ., Irvine. Dept. of Chemistry.
Chemisorption and Thermal Chemistry of Azulene and Naphthalene Adsorbed on Pt(III).
Interim rept.,
David Dahlgren, and John C. Hemminger. 1 Oct 81, 35p Rept no. TR-3
Contract N00014-79-C-0648

The ordering phenomena and thermal chemistry of the isomeric aromatic hydrocarbons azulene and naphthalene have been studied on a Pt(III) surface. Complete dehydrogenation with an onset of about 200 C is the eventual fate of these molecules absorbed on Pt(III). Several ordered phases exist for azulene overlayers as a function of coverage. Azulene overlayers with C/Pt atom ratios in the range 1-1.3 exhibit a reversible transition with temperature. The orientational ordering of neighboring molecules appears to be governed by intermolecular forces rather than the molecule-Pt interaction in both azulene and naphthalene overlayers. (Author)

AD-A107 089/5 Not available NTIS
Massachusetts Inst. of Tech., Cambridge.
Atomic Physics 7.
Final rept.,
Daniel Kleppner, and Francis M. Pipkin. 15 Jul 81, 582p AFOSR-TR-81-0689
Grant AFOSR-80-0233
Proceedings of the International Conference on Atomic Physics (7th) Held at Cambridge, MA, 4-8 Aug 80.
Availability: Plenum Press, 233 Spring St., New York, NY 10013 HC $69.50 (No copies furnished by DTIC/NTIS).

Atomic Physics 7 presents the manuscripts of the invited talks delivered at M.I.T. August 4-8, 1980. This conference continues the tradition of the earlier conferences by reviewing broad areas of fundamental atomic physics and related subjects.

AD-A107 129/9 PC **A02**/MF **A01**
Georgia Inst. of Tech., Atlanta. School of Physics.
The Drift, Diffusion, and Reactions of Slow Ions in Gases - O. N. R. Summary Questionnaire.
Rept. for 1 Nov 80-31 Oct 81,
E. W. McDaniel, and I. R. Gatland. 1 Nov 81, 7p
Contract N00014-80-C-0243

The program of research on ionic transport in gases is described. Experimental measurements of ionic mobilities and diffusion coefficients are discussed. The use of the mobility data to obtain ion-neutral interaction potentials is described. References to recent publications are given, and the program for the next year is outlined.

AD-A107 149/7 Not available NTIS
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
The Volume and Compressibility Change for the Formation of Transition Metal Sulfate Ion Pairs at 25 C,
Antonio Lo Surdo, and Frank J. Millero. 18 May 79, 20p
Contract N00014-75-C-0173, Grant NSF-OCE77-28546
Availability: Pub. in Jnl. of Solution Chemistry, v9 n3 p163-181 1980 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 154/7 Not available NTIS
IBM Thomas J. Watson Research Center, Yorktown Heights, NY.
Time-Resolved Infrared Study of Bimolecular Reactions between Tert-Butyl Radicals,
R. M. Plecenik, D. S. Bethune, J. R. Lankard, Ph. Avouris, and P. P. Sorokin. 9 Mar 81, 7p ARO-17266.1-P
Contract DAAG29-80-C-0131
Availability: Pub. in Jnl. of Chemical Physics, v75 n5 p2231-2236, 1 Sep 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 156/2 Not available NTIS
Houston Univ., TX. Dept. of Chemistry.
Application of the Semicontinuum Potential Model to Deduce Localized Electron Trapping Sites in Single Crystals of D-Sorbitol,
Larry Kevan, Shulamith Schlick, P. A. Narayana, and Da Fei Feng. 2 Feb 81, 5p ARO-17559.2-C
Contract DAAG29-80-K-0017
Prepared in cooperation with Wayne State Univ., Detroit, MI. Dept. of Chemistry.
Availability: Pub. in Jnl. of Chemical Physics, v75 n4 p1980-1983, 15 Aug 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 160/4 Not available NTIS
Illinois Univ. at Urbana-Champaign.
Linearization of the Water Sorption Isotherm for Homogeneous Ingredients Over aw 0.30 - 0.95,
Kevin W. Lang, and M. P. Steinberg. 1981, 4p ARO-15671.7-L
Grant DAAG29-78-G-0193
Availability: Pub. in Jnl. of Food Science, v46 n5 p1450-1452 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 167/9 PC **A02**/MF **A01**
IBM Research Lab., San Jose, CA.
(13)C NMR of AsF5 Doped Polyacetylene.
Technical rept.,
T. C. Clarke, and J. C. Scott. 8 Sep 81, 11p Rept no. TR-7
Contract N00014-80-C-0779

Natural abundance C13 NMR experiments using cross polarization and magic angle spinning are reported for polyacetylene as a function of AsF5 doping level. In contrast with previous authors we find that the doping of cis-polyacetylene leads, even at low doping levels, to a new signal characteristic of the doped regions of the polymer. Similar measurements on trans-polyacetylene indicate that the doping of the trans isomer proceeds considerably more uniformly than that of the cis osomer. Comparisons with appropriate model compounds suggest that the observed shift of the C13 NMR signal on doping is primarily a chemical shift rather than a Knight shift. (Author)

AD-A107 203/2 Not available NTIS
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
The Equation of State of D2O Determined from Sound Speeds,
Chen-Tung A. Chen, and Frank J. Millero. 21 Apr 81, 7p
Contract N00014-75-C-0173, Grant NSF-OCE73-0035
Prepared in cooperation with Oregon State Univ., Corvallis. School of Oceanography.
Availability: Pub. in Jnl. of Chemical Physics, v75 n7 p3553-3558, 1 Oct 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 207/3 Not available NTIS
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
Densities of NaCl, MgCl2, Na2SO4, and MgSO4 Aqueous Solutions at 1 atm from 0 to 50 C and from 0.001 to 1.5 m,
Chen-Tung A. Chen, Joanne Hwa Chen, and Frank J. Millero. 29 Feb 80, 4p
Contract N00014-75-C-0173, Grant NSF-OCE73-00351
Prepared in cooperation with Oregon State Univ., Corvallis. School of Oceanography.
Availability: Pub. in the Jnl. of Chemical and Engineering Data v25 p307-310 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 208/1 Not available NTIS
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
Review of the Experimental and Analytical Methods for the Determination of the Pressure-Volume-Temperature Properties of Electrolytes,
Frank J. Millero. 31 Jan 80, 43p
Contract N00014-75-C-0173, Grant NSF-OCE77-28546
Availability: Pub. in Thermodynamics of Aqueous Sytems with Industrial Applications, ACS Symposium Series, n133 1980 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 222/2 Not available NTIS
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
Apparent Molal Volumes and Adiabatic Compressibilities of Aqueous Transition Metal Chlorides at 25 c,
Antonio Lo Surdo, and Frank J. Millero. 3 Oct 79, 7p
Rept no. REPRINT-2483
Contract N00014-75-C-0173, Grant NSF-OCE77-28546
Availability: Pub. in Jnl. of Physical Chemistry, v84 n7 p710-715 1980 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 223/0 Not available NTIS
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
Adiabatic Partial Molal Compressibilities of Electrolytes in 0.725 m NaCl Solutions at 25 C,
Frank J. Millero, Ana Kembro, and Antonio Lo Surdo. 13 Mar 80, 8p Rept no. Reprint-2582
Contract N00014-75-C-0173, Grant NSF-OCE73-00351
Availability: Pub. in Jnl. of Physical Chemistry, v84 n21 p2728-2734 1980 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 244/6 PC **A02**/MF **A01**
Army Mobility Equipment Research and Development Command, Fort Belvoir, VA.
Determination of Sodium Gluconate in Corrosion-Removing Compounds.
Rept. for Apr 80-Apr 81,
Troy Nichols, and Laurie Mihalaki. Aug 81, 17p Rept no. MERADCOM-2333

A method is presented for the determination of sodium gluconate in the Type I MIL-C-14460B corrosion-removing compound. The procedure consists of the extraction of sodium gluconate as gluconic acid, silylation, and quantitation by gas-liquid chromatography. Qualitative confirmation of sodium gluconate is made through the retention time of the silyl derivative on the chromatographic column. (Author)

AD-A107 246/1 PC **A04**/MF **A01**
Rochester Univ., NY. Dept. of Chemistry.
Laser-Stimulated Molecular Dynamics and Rate Processes.
Technical rept.,
Thomas F. George. Nov 81, 54p Rept no. TR-14
Contract N00014-80-C-0472

A review of theoretical work by the author and collaborators and related experiments is presented for two segments of laser-induced chemistry: molecular dynamics and rate processes in the gas phase and at a solid surface and gas-surface interface. For the gas phase, the focus is on situations where the radiation interacts directly with the dynamics to enhance or create new processes. The field of laser-surface chemistry is still undergoing a procedure of definition, and progress to date is discussed. Theoretical failures as well as successes are analyzed and viewpoints are offered as to new directions for both theory and experiment. (Author)

AD-A107 340/2 PC **A03**/MF **A01**
Army Armament Research and Development Command, Dover, NJ. Large Caliber Weapon Systems Lab.
Characterization of Pollutants at Holston Army Ammunition Plant,
T. H. Chen, C. Campbell, and W. J. Fisco. Oct 81, 44p ARLCD-TR-81035, AD-E400 722

The development of reliable analytical methodologies for the identification and qualification of explosives and related pollutants in effluent wastewaters and the results obtained by direct instrumental techniques are described. This study included the evaluation of sample degradation during storage, a comparison of solvent extraction and other concentration techniques, and the development of an isotope dilution technique. The major pollutants quantified are, in the order of decreasing abundance, 1,3,5-trinintro-1,2,5-triazacyclohexane (RDX), 1-Acetyl-3,5,7-trinitro-1,3,5,7-tetraazacycooctane (SEX), 1,3,5,7-tetranitro-1,3,5,7-tetrazacyclooctane (HMX), and 2,4,6-trinitrotoluene (alpha-TNT) for the organic compounds, and sulfate, chloride, sodium, potassium, and ammonium ions for the inorganic ions. The concentrations of copper, cadmium, and chromium were found to be, respectively, about 10, 1, and 0.02 ppb.

AD-A107 365/9 PC **A03**/MF **A01**
Washington Univ., Seattle. Dept. of Chemistry.
Isotope Effect in Gas-Surface Vibrational Energy Transfer. Cyclopropane and Cyclopropane-d6 Isomerization by the VEM Technique.
Technical rept.,
W. Yuan, R. Tosa, K. -J. Chao, and B. S. Rabinovitch. 20 Oct 81, 27p
Contract N00014-75-C-0690

The study of varying molecular structure on the efficiency of vibrational energy transfer between molecules and a hot surface has been extended to the pair, cyclopropane/cyclopropane-d6. The latter is less efficient in energy loss, as corresponds to the greater vibrational eigenstate density. Conversely, the probability of energy up-transitions is enhanced; in thermal low pressure unimolecular reactions this corresponds to the inverse statistical weight secondary isotope effect. (Author)

AD-A107 393/1 PC **A06**/MF **A01**
Pennsylvania State Univ., State College. Applied Research Lab.
Corrosion Mechanism of Cu-9.4 Ni-1.7 Fe Alloy in 3.4 WT.% NaCl Solution with and without Sulfide Contamination.
Doctoral thesis,
Chiaki Kato. 3 Aug 81, 125p Rept no. ARL/PSU/TM-81-181
Contract N00024-79-C-6043

Corrosion products were developed on commercially available Cu-9.4 Ni-1.7 Fe alloy discs which rotated at 800 r.p.m. in 3.4 wt. % NaC1 solution with and without sulfide contamination for various lengths of time up to 10 days. The developed corrosion products were characterized with X-ray diffraction, SEM, and ESCA studies. Anodic and cathodic polarization curves were measured on the corrosion-product covered alloy surface as well as on the fresh surface to study the electrochemical behavior of the alloy. The results show that (i) the weight loss of the alloy during immersion in clean solution increases with time according to a parabolic rate law which is due to the mass-transfer limited anodic metal dissolution rate, and (ii) the cathodic oxygen reduction reaction on the corrosion-product covered alloy in the clean solution is controlled by the poor catalytic nature of the corrosion products; however, this catalytic capability is improved by the addition of sulfide during the formation of the corrosion products, thus a high corrosion current is obtained in sulfide-polluted 3.4 wt. % NaC1 solution. (Author)

AD-A107 474/9 PC **A02**/MF **A01**
Pennsylvania State Univ., University Park. Dept. of Chemistry.
Energy and Angle Resolve SIMS Studies of CO on Ni(001).
Technical rept.,
R. A. Gibbs, S. P. Holland, K. E. Foley, B. J. Garrison, and N. Winograd. 27 May 81, 18p
Contract N00014-80-C-0491
Pub. in Jnl. of Chemical Physics, 11p.

No abstract available.

AD-A107 495/4 PC **A03**/MF **A01**
Mississippi Univ., University. Dept. of Physics and Astronomy.
Energy and Tangential Momentum Accommodation on Different Flashed Tungsten and Gas Covered Tungsten Surfaces.
Technical rept. 1980-1981,
F. Douglas Shields. 29 Oct 81, 40p
Contract N00014-78-C-0583

The acoustical method has been used to determine energy and tangential momentum accommodation coefficients on three different polycrystalline tungsten surfaces. To obtain the second surface, the first was highly oxidized and then cleaned by vacuum flashing at 2150 K. The third surface, manufactured by the same chemical deposition process as the first, was

specified as having 1/2 the microscopic roughness of the first. Photographs made with the scanning electron microscope indicate that though the oxidation dramatically increased the roughness of the surface, this roughness was removed in the flashing process. The electron micrographs also showed that flashing dramatically increased the grain size in the third surface. This third surface, though supposedly smoother, was found to have larger AC values than the first. This has been attributed to a shorter accumulated flashing time at the time the measurements were made and, therefore, smaller grain size. The microscopic roughness does not appear to be an important factor in determining AC values after the surface is flashed. The problem of simultaneously determining energy and tangential momentum accommodation coefficients is discussed.

AD-A107 514/2 PC **A02**/MF **A01**
Indiana Univ. at Bloomington. Dept. of Chemistry.
Advances in Sample Introduction for Elemental Analysis.
Interim technical rept.,
Gary M. Hieftje. 4 Nov 81, 10p Rept nos. TR-42, 50
Contract N00014-76-C-0838

This report includes a brief summary of new techniques and advances in sample introduction for use in atomic spectrochemical analysis. Included in the review are new kinds of nebulizers, including the Babington system, the jet-impact nebulizer, and the fritted-disk unit. Also included are new arrangements for introducing solid samples into flames and plasmas. Finally, recent advances in understanding of sample transport mechanisms are discussed. (Author)

AD-A107 528/2 PC **A03**/MF **A01**
Pennsylvania Univ., Philadelphia.
Structure Study of Oxygen-Adsorbed Ni(111) Surface by High Energy Ion Scattering.
Technical rept.,
T. Narusawa, W. M. Gibson, and E. Toernqrist. 4 Nov 81, 35p Rept no. TR-6
Contract N00014-79-C-0991
Prepared in cooperation with New York State Univ. at Albany, Institute for Particle Solid Interaction.

Surface atomic structures of clean, oxygen-adsorbed, and oxidized (111) nickel have been studied quantitatively by using MeV ion scattering in combination with AES and MEED. We show that; the clean (111) nickel surface has the bulk-like structure with reconstruction or relaxation less than 0.02 A, the surface thermal vibration amplitude is enhanced by approx. 20% compared to the bulk value, adsorbed oxygen results in surface lattice expansion by approx. 0.15 A which is closely correlated to the p(2x2) or (sq root 3 times sq root 3)R30 degrees superstructure, and oxidation at room temperature saturates at a stage which incorporates approx 3 monolayers of nickel in a stoichiometric amorphous film of NiO whereas at temperatures higher than approx. 200C thicker oxide films are produced. Our study indicates that each oxygen atom adsorbed on the Ni(111) surface interacts with and relaxes three nearest neighbor nickel atoms, and after saturation of the relaxation, oxidation of three monolayers takes place abruptly after which the oxide layer on the surface apparently blocks further reaction.

AD-A107 544/9 PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Dept. of Chemistry.
Effects of Temperature on Excited-State Descriptions of Luminescent Photoelectrochemical Cells Employing Tellrium-Doped Cadmium Sulfide Electrodes.
Technical rept.,
Arthur B. Ellis, and Bradley R. Karas. 6 Oct 81, 15p Rept no. TR-7
Contract N00014-78-C-0633

The effect of temperature on excited-state deactivation processes in a single-crystal, n-type, 100 ppm CdS:Te-based photoelectrochemical cell (PEC) employing aqueous polychalcogenide electrolytes is discussed. While serving as electrodes these materials emit: (lambda sub max is about 600 nm). Photocurrent (quantum yield Thi sub x) from ultraband gap (greater than or approx. = 2.4 eV; greater than or approx. = 500 nm) 501.7 nm excitation increases modestly by less than 20% between 20 degrees and is 100 C degrees; photocurrent from band gap edge 514.5 nm excitation increases by about an order of magnitude, reaching is approx. 50-100% of the room temperature 501.7 nm value. Highlighting the competitive nature of emission and photocurrent as excited -state decay processes, luminescence (quantum yield Thi sub R) declines over the same temperature regime by factors of between 10 and 30. At most, modest red shifts of Lambda sub Max (less than 10 nm) are observed in the spectral distribution of emission with temperature. These effects are discussed in terms of optical penetration depth, band bending, and the known red shift of the CdS absorption edge with temperature. Correlations involving Thi sub x and Thi sub r suggested by the data are discussed.

DE81030061 PC **A02**/MF **A01**
Texas Southern Univ., Houston. Dept. of Chemistry.
Solvent Extraction Studies Using High-Molecular-Weight Amines.
C. McDonald. 25 Aug 81, 4p DOE/ER/04535-8
Contract AS05-76ER04535

This research project is concerned with systematically investigating high-molecular-weight amines and high-molecular-weight quaternary ammonium salts to ascertain the feasibility of their utilization for the extraction of group II B and transition metal ions from aqueous solutions. Methods which have promise of being scaled up for utilization by industries for the economical removal of toxic metal such as mercury, cadmium and nickel from their effluent waste water are being investigated. During this contract period, the following two research projects were completed: solvent extraction of mercury using alamine 304; and ion flotation of nickel using ethylhexadecyldimethylammonium bromide. (ERA citation 06:035235)

DE81030134 PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Applications of DHDECMP Extraction Chromatography to Nuclear Analytical Chemistry.
S. F. Marsh, and O. R. Simi. 1981, 10p LA-UR-81-2533, CONF-811025-1
Contract W-7405-ENG-36
25. conference on analytical chemistry and nuclear technology, Gatlinburg, TN, USA, 6 Oct 1981.

Dihexyl-N,N-diethylcarbamylmethylenephosphonate (DHDECMP) is a highly selective extractant for actinides and lanthanides. This reagent, extensively studied for process-scale operations, also has valuable analytical applications. Extraction chromatographic columns of DHDECMP, supported on inert, porous, polymer beads effectively separate most metallic impurity elements from the retained inner transition elements. The retained elements can be separated into individual fractions of (1) lanthanides, (2) americium, (3) plutonium, and (4) uranium by mixed-solvent anion exchange. (ERA citation 06:035238)

DE81030169 PC **A03**/MF **A01**
Colorado State Univ., Fort Collins.
Palladium-Catalyzed Coupling Reactions: Mechanism of Reductive Elimination. Progress Report, October 1, 1980-June 30, 1981.
J. K. Stille. Jun 81, 28p DOE/ER/04903-3
Contract AS02-78ER04903

The mechanisms of the reductive elimination of alkyl partners from palladium, particularly under reaction conditions characteristic of the palladium-catalyzed coupling of organic halides and organometals, can take place either from Pd(II) or Pd(IV). The coupling of alkyl groups from a dialkylpalladium(II) complex requires that the organic partners be cis to one another. The reaction is a first-order intramolecular process that sometimes requires prior dissociation of a ligand, leading to a Y-or T-shaped intermediate. Coupling also can take place by the prior oxidative addition of organohalide to the dialkylpalladium(II) complex to yield a palladium(IV) species from which reductive elimination takes place rapidly. The reductive elimination step takes place with retention of geometry at an sp exp 2 carbon, and retention of configuration at an sp exp 3 carbon. Which catalytic reversible cycle, Pd(O) implies Pd(II) or Pd(II) implies Pd(IV) operates depends on the organic groups, the ligands and the reaction solvent. (ERA citation 06:035275)

DE81030542 PC **A02**/MF **A01**
Florida State Univ., Tallahassee. Dept. of Chemistry.
Research in Nuclear Chemistry. Progress Report, March 1, 1981-February 28, 1982.
G. R. Choppin. 1981, 23p DOE/ER/01797-T1, ORO-1797-98
Contract AS05-76ER01797

Investigation of the properties of the actinide elements in aqueous solution continued. Analogous and complementary studies of lanthanide cations were conducted also. Potentiometry, calorimetry, solvent extraction, and nuclear magnetic resonance were the principal techniques. Evaluation of the thermodynamic values of complexation with series of alkyl dicarboxylate ligands provided understanding of the ring size for chelated complexes of these metals. Five- and-six membered chelate rings form but unless other geometrical features favor chelation, it does not seem to occur for ring sizes greater than seven. From a similar study of complexation with aromatic polycarboxylate lignas, transfer of negative charge through the pi system of the ligand enhanced the strength of complexation. Study of the PuO sub 2+2 -bicarbonate system showed that two species formed in the solutions. We assigned as these species PuO sub 2 (OH) (HCO sub 3) exp -1 and PuO sub 2 (CO sub 3) sub 2-2 . In sea water, our results indicate that soluble Pu(VI) exists about equally as PuO sub 2 (OH) sub 2 and PuO sub 2 (OH) sub 2 (HCO sub 3) exp -1 with very little PuO sub 2 (CO sub 3) sub 2-2 . This reflects a substantial difference from U(VI), as the dominant form in sea water is UO sub 2 (CO sub 3) exp -2 . A significant achievement was the automation of the titration calorimeter. This allows simpler, and more sensitive operation. Techniques for studying the redox behavior of Pu(VI) and Np(V) in the presence of organic complexing ligands were developed and initial studies begun. (ERA citation 06:035303)

DE81030545 PC **A04**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Thermodynamic Data for Flue-Gas Desulfurization Processes.
L. Brewer. Aug 81, 56p LBL-11758, CONF-801176-1
Contract W-7405-ENG-48
Flue-gas desulfurization conference, Morgantown, WV, USA, 6 Nov 1980.

The efficient design of processes for removal of sulfur dioxide resulting from coal and oil combustion requires thermodynamic and kinetic data for the various materials that might be used in the processes. Examination of the available thermodynamic data for sulfur compounds indicates serious uncertainties and a complete review is planned to provide the best set of internally consistent values obtainable from the literature and from current experiments. Although the main emphasis will be on information needed for aqueous limestone or lime slurry treatment, the data could also be used for other processes covering a wider temperature range. Thus it is planned to provide the data, when possible, for the range from room temperature to at least 1000K. The present compilation covers most of the materials that might play a role in SO sub 2 extraction processes and for which data were found. Supplements will be issued as data are obtained for additional substances of interest. (ERA citation 06:034239)

DE81030958 PC **A02**/MF **A01**
Purdue Univ., Lafayette, IN. Dept. of Chemistry.
Synchronous Fluorescence/Matrix Isolation Method for Trace Organic Analysis. Progress Report, July 1980-July 1981.
H. L. Pardue. 1981, 5p DOE/EV/10240-T1
Contract AC02-79EV10240

The first phase of the project involved assembling the instrumentation, constructing the computer interface, writing computer software, and preliminary testing. The principal components of the system are a high intensity Xenon arc lamp for excitation, two flat field f/4 spectrographs (J-4 Model UFS-2000) for dispersion of excitation and emission spectra, fused silica cuvette, an image dissector camera system (EMR Photoelectric 658A) for detection of emission intensity, a custom designed and constructed computer interface for scan control and data acquisition, and PDP-8 computer with assorted peripherals. Preliminary data indicate a range of at least 400 nm can be resolved to about 1 nm for both excitation and emission spectra. Computer interface and software are designed to permit any one of three modes of operation, namely a) the diagonal scans required to generate synchronous fluorescence spectra directly, b) random access to any set of excitation/emission coordinates, and c) total scans of any selected area (up to 100%) of the complete set of excitation/emission coordinates. The complete system became operational in late 1980 and we have been evaluating the system since that time. Data for anthracene are presented here to illustrate system response. (ERA citation 06:035236)

DE82000059 PC **A02**/MF **A01**
Illinois Univ. at Urbana-Champaign.
Phonons in Alkali Graphite Intercalation Compounds.
H. Zabel, and A. Magerl. 1981, 4p DOE/ER/01198-1365, CONF-810872-2
Contract AC02-76ER01198
International conference on phonon physics, Bloomington, IN, USA, 30 Aug 1981.

The (001)L phonon branches of alkali-graphite intercalation compounds C/sub x/M (x = 8, 24, 36; M = K, Rb, Cs) have been measured by means of inelastic neutron scattering experiments. In all cases the phonon branches show zone folding effects, due to the enlarged unit cell as compared to pristine graphite, along with opening of frequency gaps at the center and boundary of the Brillouin zone. All measured (001)L phonon dispersions are describable by one-dimensional shell models with different masses and force constants to account for the graphite and alkali area-mass densities along the c-axis and their interplanar interactions. (ERA citation 06:035220)

DE82000060 PC **A02**/MF **A01**
Illinois Univ. at Urbana-Champaign.
Thermal Expansion of Alkali-Graphite Intercalation Compounds.
S. E. Hardcastle, and H. Zabel. 1981, 4p DOE/ER/01198-1364, CONF-810872-3
Contract AC02-76ER01198
International conference on phonon physics, Bloomington, IN, USA, 30 Aug 1981.

The c-axis thermal expansion of several alkali-graphite intercalation compounds has been measured by means of x-ray scattering between 15 and 300 K. The thermal expansion depends strongly on the stage of the compound and is largest for C sub 8 M (M = K, Rb, Cs) compounds. The data have been analyzed in terms of an one-dimensional quasi-harmonic approximation, which yields Grueneisen parameters two or three times as large as for pristine graphite. (ERA citation 06:035219)

DE82000061 PC **A02**/MF **A01**
Illinois Univ. at Urbana-Champaign.
Lattice Dynamics of Graphite Intercalation Compounds: Modelled by the Phonon Dispersion of Linear Chains.
A. Magerl, and H. Zabel. 1981, 4p DOE/ER/01198-1366, CONF-810872-4
Contract AC02-76ER01198
International conference on phonon physics, Bloomington, IN, USA, 30 Aug 1981.

The characteristic features of the phonon dispersion of a monatomic linear chain in a Born-von Karman and a shell model formalism are outlined. Comparing model calculations with measurements of the (001)L phonon dispersion of intercalated graphite, we find that a shell model has to be used for an appropriate description. (ERA citation 06:035221)

DE82000067 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Development of Catalytic Systems for the Conversion of Syngas to Jet Fuel and Diesel Fuel and Higher Alcohols. Annual Report.
W. A. Slegeir. Oct 80, 18p BNL-51423
Contract AC02-76CH00016

Highlights of the year's research activities are reported. A highly active series of Fischer-Tropsch catalysts were developed during FY 1980, on the basis of insights provided by the oxide theory. The method of catalyst formulation is unique in Fischer-Tropsch chemistry, yet is simple and reproducible. These catalysts offer the promise of being superior to ordinary catalysts for hydrocarbon synthesis with regard to rate, operating conditions, and, quite possibly, product selectivity and longevity. The products of these catalysts appear to be ideally suited for use as diesel and jet fuels. Once formed, the catalysts display remarkable stability toward air. Specific descriptions of catalyst preparations and composition of matter must be withheld pending patent protection. Also during FY 1980, an exploratory program was directed toward achieving a better understanding of support effects, oxide interactions, the role of promoters, and the synergistic behavior of bimetallic catalysts systems. Some results dealing with bimetallic systems for hydrocarbon and alcohol synthesis are discussed. (ERA citation 06:034419)

DE82000233 PC **A04**/MF **A01**
Oak Ridge Y-12 Plant, TN.
Infrared and Structural Analyses of Uranium Oxidation Products: Preliminary Results.
E. L. Fuller, Jr., N. R. Smyrl, M. H. Eager, and J. B. Condon. Aug 81, 60p Y/DK-276
Contract W-7405-ENG-26

Water vapor oxidation of uranium follows a cyclic process: (1) rapid oxidation to form a thin dense, adherent layer of uranium dioxide, (2) slow diffusion of H sub 2 O and H sub 2 through this oxide, until (3) a thickness of 0.2 to 0.3 nm is achieved in a strained state that (4) relaxes from the surface allowing further (1) contiguous oxide formation and finally (5) the shards of oxide comprised of oxide laminae spall completely free of the metal surface. The oxide thus formed is hydrated on the surface. Diffuse reflectance infrared Fourier transform spectroscopy shows that these are several distinct modes of water binding delineated with respect to energetics and reversibility. Scanning electron microscopy aids immensely in defining the nature of the laminae. Implications and suggestions for further work are given to aid in a better understanding of corrosion processes. (ERA citation 06:035305)

DE82000688 PC **A03**/MF **A01**
Colorado Univ. at Boulder.
Studies of Free Radicals by Ultraviolet Excimer Laser Photolysis. Progress Report, 1 April 1981-1 October 1981.
S. R. Leone. 1981, 29p DOE/ER/10396-T1
Contract AS02-79ER10396

Recent progress is described on the study of the reactions, energy transfer, and dynamics of free radicals produced by ultraviolet laser photolysis. Free radical chain reactions are analyzed by fully time-resolved techniques involving infrared emission spectroscopy. Some of the most recent results include a mesurement of the low resolution infrared spectrum of the CH sub 3 (nu sub 2) out-of-plane bending vibrational progression. Complex chain reaction chemistry has been studied via the laser-initiated chain reaction technique to provide a general analysis of the method to obtain rate constants and to probe the time evolution of energy disposal and product formation. Methods have been developed to probe very slow chain reactions and to measure absolute rate constants for methyl radical reactions. A brief review of results from previous years is also given. (ERA citation 06:035293)

DE82001010 PC **A06**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Laser-Induced-Fluorescence Studies of Fragment Ions: CH Exp + and CD exp +.
A. O'Keefe. Aug 81, 114p LBL-13258
Contract W-7405-ENG-48
Thesis.

The dynamics of ion-molecule interactions within a mass selective rf quadrupole ion trap are studied for several ion-molecule systems. Laser induced fluorescence is used as a probe of the internal energy distributions of molecular ions under collision free conditions and under controlled collision conditions. The effects of collisions at near thermal energies (0.3 to 0.5 eV) are easily understood in terms of processes such as charge transfer and other energy transfer mechanisms. The A exp 1 PI - X exp 1 sigma exp + system of CH exp + and CD exp + has been examined under collision free conditions. The ions were produced from methane through electron impact ionization/dissociation. The observed energy distributions reflect the dynamical partitioning of dissociation exothermicity, excepting short lived electronic states. Many new transitions belonging to this electronic system have been observed and a reliable vibrational frequency for the X exp 1 sigma exp + state has been obtained. The radiative lifetimes of CH exp + and CD exp + A exp 1 PI(v = 0) states have been measured and a revised oscillator strength for the A-X transition has been derived from this data. (ERA citation 06:035554)

INT-101/I PC **A03**/MF **A01**
Institute of Physics and Nuclear Techniques, Krakow (Poland).
Influence of Grain Size on the Determination of Heavy Elements by the gamma-gamma Method.
J. Charbucinski, and K. Umiastowski. 1976, 34p
U.S. Sales Only.

The purpose of the present paper was to establish the influence of the grain size on the determination of the heavy element content by the gamma-gamma scattering method. To solve this problem Monte-Carlo numerical calculations and model measurements were performed. The calculations and measurements were performed for exp 75 Se, exp 137 Cs, and exp 60 Co sources, for lead concentrations of 1%, 3% 5%, and 10%. Grain size was varying in the 0.1 mm to 9.0 mm range. Monte-Carlo calculations and experimental data proved the strong dependence of scattered gamma radiation on the grain size of heavy metal. (Atomindex citation 10:432194)

LA-UR-80-1928 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Excited-State Proton Transfer Kinetics in 1-Naphthol Compounds and Organometallic Complexes.
S. L. Shapiro, K. R. Winn, and J. H. Clark. 1980, 11p CONF-800656-3
Contract W-7405-ENG-36
Picosecond meeting, Falmouth, MA, USA, 18 Jun 1980.

In direct measurements of excited-state proton transfer kinetic of 1-naphthol compounds + organometallic complexes, sample purity is essential. (ERA citation 05:031003)

LA-UR-80-635(Rev.) PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Using Diffusion Measurements to Determine Pore-Size Distributions in Porous Materials.
L. F. Brown, and B. J. Travis. 1980, 19p CONF-800610-5
Contract W-7405-ENG-36
American Institute of Chemical Engineering conference, Philadelphia, PA, USA, 8 Jun 1980.

A method for determining pore-size distrbutions from diffusion measurements is presented. A Wicke-Kallenbach experiment, for measuring diffusion fluxes within porous materials, was carried out over a significant portion of the transition range between Knudsen flow and bulk diffusion. If the internal porous structure of the material is modeled as myriad nonintersecting cylindrical pores, an equation may be derived for the flux as a function of pressure, in which the flux is a functional of the pore-size distribution. The equation is a Fredholm integral equation of the first kind. This is an application of the general inversion problem, and solution of the equation for the pore-size distribution is possible. It is demonstrated from calculated fluxes using postulated ideal distributions that the method works very well for both unimodal and bimodal distributions. The method is no extraordinarily sensitivire to experimental error. An example of a distribution obtained from a commercial porous catalyst is presented and compared with that obtained by mercury porosimetry. (ERA citation 05:020883)

LA-8349 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Selective Two-Step Titration of Thorium by Sulfate Displacement of the Diethylenetriaminepentaacetic Acid Complex.
P. Kiefer. Jul 80, 9p
Contract W-7405-ENG-36

Thorium and other metals are complexed with excess diethylenetriaminepentaacetic acid (DTPA) at pH 1.4, the excess DTPA is titrated with Bi(III) to a xylenol orange end point, sulfate is added to complex Th(IV), and the displaced DTPA again is titrated with Bi(III). Of 61 metal ions and nonmetal anions tested, only Ga(III), Sc(III), tungstate, citrate, oxalate, and thiosulfate interfere seriously. Lesser interferences are In(III), Zr(IV), V(IV), and permanganate. The standard deviation is 2 mu g for 56 to 840 mu g Th. (ERA citation 05:032637)

LBL-8233 PC **A11**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Post Hartree-Fock: Configuration Interaction.
1978, 246p CONF-780883-
Contract W-7405-ENG-48
Workshop on study of post Hartree-Fock: configuration interaction, Berkeley, CA, USA, 14 Aug 1978.

The workshop contained 10 lectures, one of which appeared previously in ERA. Separate were prepared for nine papers. (ERA citation 05:005062)

LBL-9062 PC **A20**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.

Partitioning of Major, Minor, and Trace Elements During Simulated in-Situ Oil Shale Retorting.
J. P. Fox. May 80, 454p
Contract W-7405-ENG-48
Thesis.

The fate of inorganic constituents in Green River, Antrim, and Moroccan oil shales during in-situ retorting has been investigated. The partitioning or distribution of 50 elements to the spent shale, shale oil, retort water, and gases was studied by completing mass balances for several runs of three simulated in-situ retorts. Byproducts and products from 24 simulated in-situ retort runs were analyzed. The effect of shale origin and retort operating conditions, including temperature, particle size, atmosphere, and gas flow rate, on partitioning patterns was investigated, and the resulting data were used to develop a conceptual model of elemental partitioning during simulated in-situ retorting. Most of the 50 elements studied are not significantly mobilized during in-situ retorting. The only elements that are distributed in large quantities to the byproducts are C, H, N, S, Cd, and Hg. Lesser but environmentally significant quatities of Se, As, Ni, and Co are distributed to the oils and waters, and at retorting temperatures in excess of about 900 exp 0 C, Se is mobilized to the gas phase. Mercury and Cd were the most mobile trace metals studied. About 70% of the Hg and 30% of the Cd were distributed to the gas phase. Mercury was released as a series of pulses in the last third of a retort run. Thermodynamic calculations indicated that elemental Hg is the major stable gas-phase species in all zones of an in-situ retort. The work demonstrated that elemental partitioning is controlled by the mineral residence of an element and the retort operating conditions employed. Significant differences were observed in the mobility and partitioning patterns of Green River, Antrim, and Moroccan oil shales. The only retorting conditions that had a statistically significant effect on partitioning patterns were temperature, input gas, particularly steam, and retort design and operation. (ERA citation 05:033296)

N82-11927/2 PC **A02**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Charge Transfer in Collisions of Li-3(+) And Be-4(+) Ions with Atomic Hydrogen at Low Impact Energy.
T. Ohyama, and Y. Itikawa. Aug 81, 22p IPPJ-532

Total charge transfer cross sections are calculated for the collisons of Li-3(+) and Be-4(+)ions with H (ls) atoms in th low energy region (E 25 keV/amu). The perturbed-stationary-state method in the impact parameter approximation is used with a basis set of adiabatic one-electron two-center molecular orbitals. For the Li-3(+)-H system, a reasonable is found between the present calculation and the recent experiment.

ORNL/TM-7405 PC **A06**/MF **A01**
Oak Ridge National Lab., TN.
High Voltage Research (Breakdown Strengths of Gaseous and Liquid Insulators) and Environmental Effects of Dielectric Gases. Semiannual Report, October 1, 1979-March 31, 1980.
L. G. Christophorou, D. R. James, and R. Y. Pai. Aug 80, 117p
Contract W-7405-ENG-26

Topics covered include basic studies of gaseous dielectrics, direct current breakdown strengths of gases/mixtures, environmental effects studies and decomposition analyses, impulse studies, breakdown strengths of binary mixtures with concentric cylinder geometry, and a discussion of the experimental apparatus. (ERA citation 05:034238)

PAT-APPL-6-301 075 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Cooling by Conversion of Para to Ortho-Hydrogen.
Patent Application,
A. Sherman. Filed 10 Sep 81, 14p N82-10358/1, NASA-CASE-GSC-12770-1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

The cooling capacity of a solid hydrogen cooling system is significantly increased by exposing vapor created during evaporation of a solid hydrogen mass to a catalyst and thereby accelerating the endothermic para-to-ortho transition of the vapor to equilibrium hydrogen. Catalysts such as nickel, copper, iron or metal hydride gels of films of nickel, copper or iron or hydride gels of nickel, copper or iron in a low pressure drop catalytic reactor are suitable for accelerating the endothermic para-to-ortho conversion.

PB82-107285 PC **A03**/MF **A01**
Radian Corp., Austin, TX.
On-Site GC/MS Analysis of Chapman Gasification Separator Liquor.
Final rept. Jul 80-Mar 81,
C. J. Thielen, R. A. Magee, and R. V. Collins. Aug 81, 45p EPA-600/7-81-136
Contract EPA-68-02-3137

The report gives results of a characterization of a wastewater stream from a coal gasification plant, using on-site extraction and GC/MS analysis. Extractable material in the wastewater was primarily phenols and alkylphenols, accounting for about 99% of the total mass identified. Several polynuclear aromatic compounds were also identified. The composition of the sample deteriorated even though the water was held in amber bottles at 4C: this was most evident in the concentration of dimethylphenols which dropped about 75% during 2 weeks of refrigerated storage. Ambient sample storage produced a greater decrease in the concentration of phenol, but did not appear to affect the alkylphenols or the base/neutral compounds as much. The observed changes in composition should hamper any off-site wastewater treatbility studies with waters of this type. Diisopropyl ether (DIPE) extraction confirmed the 99-plus % removal efficiency of phenol which had been demonstrated in previous studies. Wet oxidation removed organics almost as efficiently as DIPE extraction, but may have limited use because of its high operating cost.

PB82-108044 Not available NTIS
National Bureau of Standards, Washington, DC.
An Analysis of Markovian Model Microfield Methods for Stark Broadening.
Final rept.,
Earl W. Smith, Bernard Talin, and J. Cooper. 1981, 33p
Pub. in Jnl. of Quantitative Spectroscopy and Radiative Transfer 26, n3 p229-242 1981.

Stark broadening theories which concentrate on the statistics of the plasma electric microfield rather than the dynamics of collisions have come to be known as Model Microfield Methods. In the present paper, the authors present an analysis of Stark broadening problems based on Markovian model microfield statistics. Our derivation permits an easy comparison with traditional Stark broadening theories such as the impact and unified theories; this comparison is used to clarify the physical nature of the approximations employed by Markovian models. The strength and weaknesses of various models are discussed, emphasizing the kangaroo process of Brissaud and Frisch, and methods are suggested for improving the current model microfield approach.

PB82-133125 PC **A03**/MF **A01**
National Inst. for Metallurgy, Randburg (South Africa).
The Direct Determination, by Differential Pulse Anodic-Stripping Voltammetry at the Thin Mercury-Film Electrode, of Cadmium, Lead, and Copper,
A. F. Lee. 21 Aug 81, 45p NIM-2124, ISBN-0-86999-550-2

This report describes the development and application of a voltammetric procedure for the direct, simultaneous determination of cadmium, lead, and copper in three SAROC reference materials (carbonatite, magnesite, and quartz). The electrolyte was a mixture of 1 M ammonium chloride, 0,1 M citric acid, and 0,025 M ascorbic acid. No interferences were encountered from Fe(III), As(III), Sb(V), Tl(I), or In(III) at the concentrations present in the samples. Intermetallic interferences were eliminated by the use of thin mercury-film electrodes not less than 80 nm thick. Limits of detection were determined by the degree to which the supporting electrolyte could be purified, and were estimated to be 10 ng/g, 250 ng/g, and 150 ng/g for cadmium, lead, and copper respectively.

PB82-133851 Not available NTIS
National Bureau of Standards, Washington, DC.
Excitation of the O(2)(a sup 1 delta(g)) State by Low Energy Electrons.
Final rept.,
K. Tachibana, and A. V. Phelps. 1981, 6p
Sponsored in part by Air Force Weapons Lab., Kirtland AFB, NM.
Pub. in Jnl. Chemical Physics 75, n7 p3315-3320, 1 Oct 81.

Coefficients for the excitation of the a sup 1 delta(g) metastable state of O2 by low energy electrons in O2-Ar mixtures have been measured using a drift tube technique. The experimental electron excitation coefficients agree satisfactorily with values calculated using previously derived sets of electron collision cross sections for O2 and Ar.

PB82-133877 Not available NTIS
National Bureau of Standards, Washington, DC.
Nitrogen Sensitivities of a Sample of Commercial Hot Cathode Ionization Gage Tubes.
Final rept.,
K. E. McCulloh, and C. R. Tilford. Apr 81, 3p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Jnl. of the Vacuum Science and Technology 18, n3 p994-996 Apr 81.

In order to help assess the magnitude of errors that might arise from the use of uncalibrated ionization gage tubes and help select the best type of tube when accurate measurements are required the authors have determined the nitrogen sensitivities from 10-5 to 10-2 Pa for lots of from two to four each of five different types of commercial hot cathode gage tubes. Included were conventional triodes and B-A structures of four distinct types. Two types with tungsten filaments -- the triodes and tabulated B-A structures -- were markedly superior to the others with respect to agreement with manufacturer's sensitivity, linearity, and uniformity of sensitivity within a type. The least satisfactory results were obtained from the nude B-A structures, which showed significant nonlinearities, sensitivities ranging from 70%-110% of the manufacturer's value, and typical 25% differences in sensitivity between the two filaments of a dual-filament structure.

PB82-133901 Not available NTIS
National Bureau of Standards, Washington, DC.
Bifurcations and Multistability in Two-photon Processes.
Final rept.,
D. F. Walls, D. V. Kunasz, P. D. Drummond, and P. Zoller. Jul 81, 4p
Pub. in Physical Review A 24, n1 p627-630 Jul 81.

The authors considered an intracavity nonlinear medium interacting with two modes of the electromagnetic field via a two photon process. The cavity is coherently driven at the frequencies of the two modes. They considered as the intracavity medium (a) a two photon absorber, (b) N three level atoms. These systems display a new class of bifurcations and in the case of the two photon absorber optical tristability is possible.

PB82-133919 Not available NTIS
National Bureau of Standards, Washington, DC.
Electron-Ion Collisions.
Final rept.,
G. H. Dunn. 1980, 47p
Pub. in Proceedings of the Physics of Ionized Gasses, Dubrovik, Yugoslavia, August 25-30, 1980, p49-95.

Worldwide interest in and excitement over both controlled thermonuclear fusion and space physics coupled with advancing technology have generated significant efforts to determine cross sections for electron collisions with ions. Early work in various laboratories dates from the late 1950's, but it was not until 1961 that a successful measurement was reported. Since that time much work has been done and a number of reviews have been written on experimental techniques and results as well as on theory. This paper will emphasize experimental results and methods, with an attempt to update the excellent review of Dolder and Peart, which has a similar emphasis. Some overlap occurs with the Dolder and Peart paper; since some issues facing the field remain the same, and methods and examples for orientation and clarification may be the same. Processes of high interest in electron-ion collisions include: excitation, ionization, recombination, dissociation, and detachment. Only the first three will be discussed here. Rate measurements in plasmas also, of course, give valuable information about the processes in question and rate coefficients are -- in many cases -- what the user community ultimately needs for modelling and diagnostics. However, the author confines the discussion here to cross sections from which rate coefficients may be calculated and

which make a more meaningful test of theory. An extensive bibliography is included.

PB82-133950 Not available NTIS
National Bureau of Standards, Washington, DC.
Determination of Polychlorinated Biphenyls in Waste and Lubricating Oils.
Final rept.,
S. N. Chesler, W. E. May, P. A. White, R. M. Parris, and F. R. Guenther. Nov 80, 3p
Pub. in Proceedings of Joint Conference on Measurements and Standards for Recycled Oil/Systems Performance and Durability, Gaithersburg, Maryland, October 23-26, 1979, p295-297 Nov 80.

A new method is reported for the determination of polychlorinated biphenyls (PCB) in waste and lubricating oils. The method utilizes high-performance preparative scale liquid chromatography for sample clean up and glass capillary gas chromatography with electron capture detection for quantitation. The method was found superior to prior existing methods.

PB82-133976 Not available NTIS
National Bureau of Standards, Washington, DC.
Differential Pulse Detection in Liquid Chromatography and Its Application to the Measurement of Organometal Cations.
Final rept.,
William A. MacCrehan. Jan 81, 4p
Pub. in Analytical Chemistry 53, n1 p74-77 Jan 81.

An examination is made of some advantages of differential pulse over amperometric electrochemical detection under certain measurement circumstances. The added selectivity, high sensitivity, and low base line drift of the differential mode are discussed. The separation and low level detection of organomercury and organotin cations are examined. Finally, the use of differential pulse detection for the elimination of electrode fouling problems is demonstrated.

PB82-134362 PC **A06**/MF **A01**
National Bureau of Standards, Washington, DC.
Standard Reference Data Publications, 1964-1980,
Gertrude B. Sherwood. Nov 81, 125p NBS-SP-612

This document provides a comprehensive list of the outputs of the National Standard Reference Data System (NSRDS) with author, materials, and property indexes for the years 1964-1980. NSRDS data centers prepare evaluated data bases of physical and chemical properties of substances. The program is managed by the National Bureau of Standards' Office of Standard Reference Data. Data bases are available in printed form, on magnetic tapes, and through online computer networks.

PB82-135161 PC **A09**/MF **A01**
National Bureau of Standards, Washington, DC. National Measurement Lab.
Standard Reference Materials: Summary of the Clinical Laboratory Standards Issued by the National Bureau of Standards.
Final rept.,
R. W. Seward, and R. Mavrodineanu. Nov 81, 180p
NBS-SP-260-71
Library of Congress catalog card no. 81-600149.

This publication is a summary of the Clinical Laboratory Standards issued by NBS as Standard Reference Materials (SRM's). The material, composition, certification, use, and remarks concerning each of the SRM's described are presented in tabular form. Copies of the certificates for these SRM's are contained in the appendix for more detailed information.

PB82-137332 Not available NTIS
National Bureau of Standards, Washington, DC.
Electron-Impact-Ionization Cross Sections and Rates for Highly Ionized Beryliiumlike Ions.
Final rept.,
S. M. Younger. Sep 81, 8p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Physical Review A 24, n3 p1278-1285 Sep 81.

Electron-impact-ionization cross sections and rates have been calculated for several beryliiumlike ions in the 1 doublet S 2 doublet S 1supS ground state and the 1 doublet S 2s 2 triplet p 3supP metastable state using a distorted-wave Born exchange approximation. A comparison with available experimental data shows good agreement between measurements and distorted-wave calculations.

PB82-137340 Not available NTIS
National Bureau of Standards, Washington, DC.
Cross Sections and Rates for Direct Electron-Impact Ionization of Sodiumlike Ions.
Final rept.,
S. M. Younger. Sep 81, 6p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Physical Review A 24, n3 p1272-1277 Sep 81.

Cross sections and rate coefficients for the direct electron-impact ionization of sodiumlike ions have been calculated in a distorted-wave Born exchange approximation. For higher charge states the cross section is dominated by inner-shell ionization of the 2p sup 6 subshell. Analytic fits to the data allow rapid calculation of cross sections and rate coefficients over a wide range of incident electron energies. The importance of electron-impact excitation to autoionizing states is discussed.

PB82-137357 Not available NTIS
National Bureau of Standards, Washington, DC.
Electron Impact Ionization Cross Sections and Rates for Highly Ionized Atoms.
Final rept.,
S. M. Younger. 1981, 9p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Jnl. of Quantitative Spectroscopy and Radiative Transfer 26, n4 p329-337 1981.

Electron impact ionization cross sections and rates for hydrogen-, helium- and lithium-like ions are presented in simple analytical form, based on a set of parameters used in the formulae allow rigid generation of cross sections and rates for any ion in these sequences with a minimum of computational effort. The use of accurate Bethe slopes in the cross section-fitting algorithm yields good accuracy both in the near threshold and high energy regions. The rate coefficient is given in the form of a correction to the commonly used Seaton formula and is thus readily adaptable to existing plasma modeling computer codes. Comparisons of the present results with other theoretical and experimental data are made.

PB82-137373 Not available NTIS
National Bureau of Standards, Washington, DC.
The Adsorption of NO on Ni (111): An ESDIAD/LEED Study.
Final rept.,
Falko P. Netzer, and Theodore E. Madey. 1981, 10p
Sponsored in part by Office of Naval Research, Arlington, VA.
Pub. in Surface Science 110, p251-260 1981.

The ESDIAD method (electron stimulated desorption ion angular distributions) has been combined with LEED (low energy electron diffraction) in a study of the adsorption of NO on Ni(111). For adsorption at 80 K, NO appears to be bonded with its molecular axis perpendicular to the Ni(111) surface at all coverages. Heating the 80 K layer leads to a striking structural change which the authors interpret as the formation of inclined or bent NO in the range 120 less than or equal to T less than or equal to 250 K. Upon adsorption at 150 K, only the bent form of NO is present at low coverages; at higher coverages at 150 K, the perpendicular form appears, in agreement with recent electron energy loss spectroscopy (EELS) data of Lehwald, Yates, and Ibach. When NO is coadsorbed with p(2 x 2) oxygen, the perpendicular form of NO dominates at all coverages and temperatures studied. Dissociated NO adsorbed at steps and defect sites on Ni(111) produces a well-defined hexagonal ESDIAD pattern.

PB82-137407 Not available NTIS
National Bureau of Standards, Washington, DC.
The 4f(13)5f Configuration in the Isoelectronic Sequence of Yb III.
Final rept.,
J. F. Wyart, V. Kaufman, and J. Sugar. 1981, 10p
Pub. in Physica Scripta 23, p1069-1078 1981.

Energy levels of the configuration 4f(13)Sf have been observed for the first time in the spectra of Lu IV, Hf V, Ta VI, and W VII and have been interpreted by means of the Slater-Condon theory. The relative positions of two perturbing configurations 4f(12)Sd(2) and 4f(14)5p(5)5f are discussed. The jj coupling scheme provides the best average purity for the labeling of the levels. Three hundred seventy-seven lines have been classified in these four spectra.

PB82-137423 Not available NTIS
National Bureau of Standards, Washington, DC.
Behavior of a Nonconformal Mixture via Computer Simulation.
Final rept.,
H. J. M. Hanley, and Denis J. Evans. 1981, 19p
Sponsored in part by Fulbright Foundation, Washington, DC.
Pub. in Int. Jnl. Thermophys. 2, n1 p1-19 1981.

A binary 50% mixture of soft spheres is studied via nonequilibrium molecular dynamics, and the equilibrium and nonequilibrium radial distribution functions for a nonconformal mixture with a mass ratio of 10 and a size ratio of about 2 are examined. This model system is related to the real methane/decane mixture, and it is shown that apparently anomalous properties of this mixture, especially the viscosity, could perhaps be understood in terms of the local or ambient mole fraction. In addition, the postulates of the Van der Waals one fluid conformal solution theory are discussed, and a mixing rule for the mass is derived.

PB82-138140 PC **A06**/MF **A01**
National Bureau of Standards, Washington, DC. National Measurement Lab.
NBS Standard Reference Materials Catalog, 1981-83 Edition.
Special pub.,
R. W. Seward. Nov 81, 125p NBS-SP-260
Supersedes PB-294 666.

This Catalog lists those Standard Reference Materials (SRM's), Research Materials (RM's), and Special Reference Materials (GM's) that are available from the National Bureau of Standards (NBS), and those that are soon to be available. The Catalog describes these materials as to their certified characterization, unit size, and type, as well as providing ordering information. Prices for these materials are listed separately in annual supplements to this Catalog.

PB82-138355 PC **E03**/MF **E03**
Commission of the European Communities, Luxembourg.
The Certification of Polycyclic Aromatic Hydrocarbon Materials (PAH). Part II: The Six Methylchrysene Isomers (BRC Reference Materials No. 77, 78, 79, 80, 81 and 82),
W. Karcher, R. Fordham, and J. Jacob. 1981, 43p
EUR-7175-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The purity of six synthesized PAH materials (all six methylchrysene isomers) was determined in an interlaboratory exercise of laboratories of EC Member Countries and of two laboratories of the Commission of the EC. The purity analysis was carried out using independent analytical methods (gas chromatography, high performance liquid chromatography and mass spectrometry). The certification procedure and experimental details of the analyses are described.

PB82-138868 PC **A03**/MF **A01**
Calgary Univ. (Alberta). Dept. of Chemical and Petroleum Engineering.
Kinetics of Gas Hydrate Formation. Part I: Kinetics of Ethane Gas Hydrate Formation. Part II: Kinetics of Natural Gas Hydrate Formation.
Final rept. Jun-Dec 80,
P. Raj Bishnoi, and Anthony Vysniauskas. 18 Dec 80, 45p GRI-80/0100
Contract GRI-5080-363-0312

The kinetics of formation of ethane gas hydrate and a natural gas hydrate were investigated. The ethane gas hydrates were studied in the temperature range from 274.9 to 282.3 K at pressures from 7 to 20 bars. The natural gas hydrates were investigated in the temperature range from 275.9 to 279.7 K at pressures from 13 to 37 bars. The reaction rate characteristics for ethane and the natural gas were found to be similar to those for methane. An increase in pressure increases the reaction rate whereas a corresponding increase in temperature decreases the reaction rate. The order of the reaction with respect to pressure is close to three and the apparant energy of activation was found to be negative. The model used to correlate the data was the same as that used for methane hydrate formation and appears to be consistent with the experimental data.

PB82-139445 PC **E03**/MF **E03**
Commission of the European Communities, Luxembourg.
Improvements to Asbestos Diaphragms and Prospects for Their Replacement (Verbesserung von Asbest-Diaphragmen und deren eventueller Ersatz).
Final rept.
c1980, 30p
Text in German.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Diaphragms and membranes for use in alkaline water electrolysis and manufacture of asbestos or reinforced asbestos, plastics materials, ceramics, carbon, sintered or porous nickel were tested and compared for their permeability to liquids, for gas separation, electrical resistance in electrolytic operations, and for degradation at higher temperatures. A cost/effectiveness exercise, additionally taking into account the relation between higher current density and low voltage, showed that specially selected asbestos materials still are the recommended materials, although a polypropylene-PTFE diaphragm had some advantages.

PB82-139866 PC **A06**/MF **A01**
Pau Univ. (France). Inst. Univ. de Recherche Scientifique.
Theoretical Study of the Process of Unimolecular Dissociation of Radicals (Etude Theorique des Processus de Dissociation Unimoleculaire des Radicaux),
Balkacem Mouflih. 2 Mar 79, 116p
Text in French.

Chemists have long used mass spectrometry as a means of access to molecular structures. A series of empirical rules permit the forecasting of the fragmentation of an organic molecule under electronic impact. A coherent theory was then required to explain and forecast the observed fragmentations. This study reviews the different theoretical models proposed; different methods of quantum mechanics frequently used are discussed. A study of the process of dissociation ionization of a certain number of molecules is made, using methods of calculus on the different models. The 'quality' of the function of the wave utilized (semi-empirical or ab initio) for the results obtained is examined. Recently developed methods in photochemistry are applied to mass spectrometry. The study is limited to the methanol molecule.

PB82-140575 PC **A05**/MF **A01**
National Bureau of Standards, Washington, DC.
Journal of Research of the National Bureau of Standards. Volume 86, Number 5, September-October 1981.
1981, 94p
See also Volume 86, Number 4, PB81-247017, PB82-140583, PB82-140591, PB82-140609, PB82-140617, PB82-140625 and PB82-140633. Library of Congress catalog card no. 63-37059.

Contents:
- Prediction of the critical line of a binary mixture: evaluation of the interaction parameters;
- Propagation of density fluctuations in nonuniform fluids: simple models;
- A transient hot wire thermal conductivity apparatus for fluids;
- The graphite calorimeter as a standard of absorbed dose for Cobalt-60 gamma radiation;
- Upper limits for the number of bound states associated with the Yukawa potential;
- A 'Uniformity Principle' for evacuation route allocation.

PB82-140583
(Order as PB82-140575, PC **A05**/MF **A01**)
Colorado Univ. at Boulder. Dept. of Chemical Engineering.
Prediction of the Critical Line of a Binary Mixture: Evaluation of the Interaction Parameters,
B. E. Eaton, J. Stecki, P. Wielopolski, and H. J. M. Hanley. 23 Mar 81, 9p
Prepared in cooperation with Polish Academy of Sciences, Warsaw. Inst. of Physical Chemistry. Sponsored in part by National Bureau of Standards, Boulder, CO. and National Science Foundation, Washington, DC.
Included in Jnl. of Research of the National Bureau of Standards, v86 n5 p419-427, Sep-Oct 81.

The critical line of the binary mixture methane-ethane is calculated via the extended corresponding states Van der Waals one fluid theory. The Gibbs free energy criticality criteria are solved numerically. The numerical derivatives are compared with the exact analytical results derived previously for the special case of the shape factors of the extended corresponding states set equal to unity. Binary interaction parameters are adjusted to give a best fit of the critical line to experimental data. These interaction parameters are then used to evaluate vapor liquid equilibrium data away from the critical region. It appears that a fit of the critical line is not sufficient to obtain binary interaction parameters of general applicability. Optimization of the critical point predictions for the pure components is also discussed.

PB82-140591
(Order as PB82-140575, PC **A05**/MF **A01**
National Bureau of Standards, Boulder, CO. National Engineering Lab.
Propagation of Density Fluctuations in Nonuniform Fluids: Simple Models,
James C. Rainwater. 4 May 81, 27p
Included in Jnl. of Research of the National Bureau of Standards, v86 n5 p429-455, Sep-Oct 81.

As a first step toward the understanding of Rayleigh-Brillouin scattering from a fluid with a temperature gradient, the author analyzes the initial value problem for certain prototype one-dimensional nonuniform systems. For sufficiently short times and localized initial pulses, it is not necessary to impose actual physical boundaries on the linearly nonuniform system. By a straightforward, though unconventional, application of Fourier and Laplace transform methods, explicit and physically reasonable solutions are constructed for the propagation of fluctuation pulses in space and time according to the nonuniform wave and diffusion equations and a special case of the nonuniform damped wave equation. The analog of the dynamic structure factor is also constructed for the latter two cases.

PB82-802422 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Chemical Analysis of Aerosols and Airborne Particulates. 1977-June, 1980 (Citations from the NTIS Data Base).
Rept. for 1977-Jun 80.
Dec 81, 212p

This bibliography cites reports covering the chemical analysis and composition of aerosols and airborne particulate matter. It excluded those covering particle sampling techniques and size analysis. Some of the techniques that are described include chromatography, activation analysis, and spectroscopic analysis. (This bibliography contains 206 citations, none of which are new entries to the previous edition.)

PB82-802430 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Chemical Analysis of Aerosols and Airborne Particulates. July, 1980-November, 1981 (Citations from the NTIS Data Base).
Rept. for Jul 80-Nov 81.
Dec 81, 91p
Supersedes PB80-814346, and NTIS/PS-79/0791. See also 1964-76, NTIS/PS-78/0755.

This bibliography cites reports covering the chemical analysis and composition of aerosols and airborne particulate matter. It excluded those covering particle sampling techniques and size analysis. Some of the techniques that are described include chromatography, activation analysis, and spectroscopic analysis. (This bibliography contains 85 citations, all of which are new entries to the previous edition.)

PB82-802778 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
X-Ray Fluorescence Analysis. 1975-June, 1980 (Citations from the NTIS Data Base).
Rept. for 1975-Jun 80.
Dec 81, 268p

Techniques, apparatus, equipment design, and applications of x ray fluorescence analysis are cited. The bibliography includes references on the theory, excitation sources and detectors, and data reduction and analysis. (This updated bibliography contains 261 citations, none of which are new entries to the previous edition.)

PB82-802786 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
X-Ray Fluorescence Analysis. July, 1980-November, 1981 (Citations from the NTIS Data Base).
Rept. for Jul 80-Nov 81.
Dec 81, 118p
Supersedes PB80-813355, and NTIS/PS-79/0748. See also 1964-74, NTIS/PS-76/0677.

Techniques, apparatus, equipment design, and applications of x ray fluorescence analysis are cited. The bibliography includes references on the theory, excitation sources and detectors, and data reduction and analysis. (This updated bibliography contains 111 citations, all of which are new entries to the previous edition.)

PB82-858994 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Ion Exchange Resins. June, 1970-1981 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Dec 81.
Dec 81, 291p
Supersedes PB81-855306.

Reports are cited which discuss the preparation, properties, and applications of ion exchange resins. Included is their utilization in water and waste treatment, in chemical reactions, as catalysts, in ore treatment and recovery, in desalination, and in various recovery, purification, and separation processes. The regeneration of the resins is also discussed. (This updated bibliography contains 294 citations, 111 of which are new entries to the previous edition.)

PB82-859265 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Analysis of Solid Surfaces. June, 1976-1981 (Citations from the Energy Data Base).
Rept. for Jun 76-Dec 81.
Dec 81, 301p
Supersedes PB80-856495. Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography covers techniques and technology for the analysis of surfaces of many types of materials or substances. Consideration is given to spectroscopic, chemical, x-ray, and ion beam techniques and apparatus for microanalysis and characterization of surfaces. (This updated bibliography contains 309 citations, 227 of which are new entries to the previous edition.)

PB82-859752 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Polymer Morphology. July, 1970-December, 1981 (Citations from the Engineering Index Data Base).
Rept. for Jul 70-Dec 81.
Dec 81, 254p
Supersedes PB81-855017.

This bibliography cites reports on polymer morphology. The investigations cover mechanical properties, fracture morphology, processing morphology, electrical properties, and specialized properties. The techniques used in the investigations include microscopy, electron beam spectroscopy, tensile tests, impact tests, and optical and rheological studies. Investigations into microstructure include studies of orientation, blends and crystals for polymer films, resins, glasses, fibers, fabrics, and elastomers for block, segmented, and crystalline forms. (This updated bibliography contains 238 citations, 17 of which are new entries to the previous edition.)

7E. Radio and Radiation Chemistry

AD-A106 943/4 PC **A05**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.

Evaluation of Gamma Radiation for Destruction of Pentachlorophenol in Aqueous Solution and on Activated Carbon.
Doctoral thesis,
Stephen Grant TerMaath. Dec 79, 97p Rept no. AFIT-CI-79-307D-S

This research was conducted to determine the applicability of gamma radiation from a cobalt 60 source as a treatment method for low concentrations of toxic or hazardous materials in aqueous solution. Irradiation of the toxic materials toluene, trichloroethylene and pentachlorophenol (PCP) showed their susceptibility to radiation treatment when destruction of the initial material was used as the main criteria for evaluating experimental results. Initial PCP concentrations of 5,15 and 25 mg/1 were reduced to a level of one part per billion at absorbed dosages of 100, 200 and 300 krads, respectively, and corresponding destruction rates were 5.0, 7.5 and 8.3 mg/1 PCP per 100 krads. The ability to destroy PCP in other than aqueous solution was also examined. Benzene was selected as a solvent because it had a minimum of any degradation products. No PCP degradation was observed in a 25 mg/1 solution at dosages of 300 and 1000 krads. The ability of activated carbon to readily adsorb pentachlorophenol provided a means of concentrating PCP in order to reduce the volume of material that would require radiation treatment. As a result of this irradiation of the carbon, regeneration of activated carbon was achieved.

DE81030942 PC **A03**/MF **A01**
Notre Dame Univ., IN. Radiation Lab.
Radiation Laboratory, University of Notre Dame. Quarterly Report, April 1, 1981-June 30, 1981.
14 Jul 81, 47p DOE/ER/00038-2262
Contract AC02-76ER00038

Sixty-six abstracts are presented of individual research projects in the fields of radiation chemistry and photochemisty. (ERA citation 06:035298)

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

AD-A106 973/1 PC **A08**/MF **A01**
Oregon State Univ., Corvallis. School of Oceanography.
A Study of the Invertebrates and Fishes of Salt Marshes in Two Oregon Estuaries.
Miscellaneous rept.,
Duane L. Higley, and Robert L. Holton. Jun 81, 170p CERC-MR-81-5
Contract DACW72-77-C-0013

Sweep nets, corers, enclosures, and clip-quadrat samplers were used to collect both quantitative and nonquantitative samples of invertebrates in level marsh, pan, tidal creek, and tidal flat habitats located in seven study areas representing various types of marsh. Fish in these habitats, as well as in a slough and in bay channels, were sampled by seine and otter trawls. Community taxonomic composition and trophic structure, along with fish stomach contents, are presented as relative frequency histograms and pie charts. Dominant invertebrate taxa in terrestrial collections were Acarina, Homoptera, and Diptera, and in aquatic collections were Capitellidae (polychaeta), Oligochaeta, Gnorimosphaeroma (Isopoda), and Anisogammarus and Corophium (Amphipoda). Three-spine stickleback and young staghorn sculpin were by far the most common fish species throughout the marsh zone; juvenile salmonids and other species were captured only in submerged level marshes and in a slough. Trophic structure of terrestrial and aquatic invertebrate communities was generally heavily weighted to detritivores and scavengers. The herbivore component increased from low marsh to high marsh and was the dominant trophic type in the higher vegetation (sweep net collections) of the high marsh. Araneae was the dominant invertebrate carnivore in the terrestrial communities. Fish consumed primarily aquatic animals, even those captured in tidal creek and submerged level marsh habitats where tidal inundation would be expected to make terrestrial foods available.

AD-A106 984/8 PC **A11**/MF **A01**
Washington Univ., Seattle. Fisheries Research Inst.
Juvenile Salmonid and Baitfish Distribution, Abundance and Prey Resources in Selected Areas of Grays Harbor, Washington.
Final rept. Mar-Oct 80,
Charles A. Simenstad, and Douglas M. Eggers. Sep 81, 228p Rept no. FRI-UW-8116
Contract DACW67-80-C-0102

A comprehensive studies of juvenile salmonids, English sole, and baitfish and their epibenthic and neritic prey communities was conducted in Grays Harbor in order to evaluate the potential effects of dredging proposed for widening and deepening the existing navigation channel. Quantitative stomach analyses of juvenile salmonids and English sole indicated that they fed mainly in the epibenthic and neritic habitats in which they were captured. Fishes occupying shallow sublittoral or lower littoral habitats fed mainly on epibenthic crustaceans--primarily harpacticoid copepods, cumaceans, and gammarid amphipods--while those captured in neritic habitats tended to be larger in size and fed upon more pelagic prey such as larval northern anchovy and drift insects. Potential impacts of the proposed dredging project were considered to be either a direct reduction in the fish populations as a result of dredging operations or an indirect reduction of the carrying capacity by removal of preferred habitat or alteration of migration or residence patterns. Of the indirect effects assessed in this report, only the permanent loss of shallow sublittoral habitat, estimated to involve 1.1% of the total sublittoral habitat in the estuary, may be deleterious particularly to juvenile chinook and chum salmon, and young-of-the-year English sole, which forage and rear almost exclusively in this habitat in Grays Harbor. (Author)

AD-A107 022/6 Not available NTIS
Texas A and M Univ., College Station. Dept. of Biology.
Ontogeny of Respiratory and Growth Responses of Larval Mud Crabs Rhithropanopeus harrisii Exposed to Different Temperatures, Salinities and Naphthalene Concentrations,
Roy B. Laughlin, Jr., and J. M. Neff. 16 Apr 81, 14p
Grant NSF-OCE75-04890
Availability: Pub. in Marine Ecology - Progress Series, v5 p319-322, 15 Aug 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 083/8 PC **A22**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS.
Proceedings, 15th Annual Meeting, Aquatic Plant Control Research Planning and Operations Review, held 17-20 November 1980, Savannah, Georgia.
Final rept.
Oct 81, 511p Rept no. WES-MP-A-81-3

Topics at this meeting included: Problem Identification and Assessment; Technology Development in Biological Control; Mechanical Control; Chemical Control; Large-Scale Operations Management Tests; and Aquatic Plant Control in the Panama Canal.

PB82-132622 PC **E10**/MF **A01**
Washington Univ., Seattle. Coll. of Forest Resources.
Marine Bird Populations of the Strait of Juan de Fuca, Strait of Georgia and Adjacent Waters in 1978 and 1979,
Terence R. Wahl, Steven M. Speich, David A. Manuwal, Katherine V. Hirsch, and Christine Miller.
Oct 81, 291p EPA-600/7-81-156
Sponsored in part by National Oceanic and Atmospheric Administration, Seattle, WA. Includes six sheets of microfiche.

The threat of oil pollution in the Strait of Juan de Fuca has prompted this study of marine birds in Washington State. The study was conducted from 1 January 1978 to 31 December 1979 in the Strait of Juan de Fuca north to the San Juan Islands and Point Roberts and west to Sidney, British Columbia. Major objectives were to determine the time of occurrence, distribution, abundance, and locations of important concentrations of marine birds. Data were obtained on breeding marine birds on 99 geographic units in American waters.

PB82-134065 PC **E10**/MF **A01**
Mathematical Sciences Northwest, Inc., Bellevue, WA.
Evaluation of Existing Marine Intertidal and Shallow Subtidal Biologic Data,
Judith E. Zeh, Jonathan P. Houghton, and Dennis C. Lees. Jul 81, 278p EPA-600/7-81-036
Prepared in cooperation with Dames and Moore, Seattle, WA. Sponsored in part by National Oceanic and Atmospheric Administration, Seattle, WA. Includes two sheets of microfiche.

This study was initiated in order to evaluate a large set of marine intertidal and shallow subtidal biologic data collected in two baseline study programs in the marine waters of northwestern Washington between 1974 and 1979. This report summarizes and compares methodologies. Communities in three broad habitat categorizations--rocky intertidal, soft substrate intertidal, and subtidal--were examined by means of cluster analysis. For the intertidal habitats, numerical assemblage parameters such as richness, biomass, and diversity were computed and examined by means of multiple regression and analysis of variance to fulfill the first study objective.

PB82-140187 PC **A05**/MF **A01**
Fish and Wildlife Service, Washington, DC. Office of Biological Services.
Distribution and Abundance of Marine Birds and Mammals Wintering in the Kodiak Area of Alaska.
Rept. for 1979-80,
Douglas J. Forsell, and Patrick J. Gould. Sep 81, 87p FWS/OBS-81/13
Prepared in cooperation with Bureau of Land Management, Anchorage, AK. Alaska Outer Continental Shelf Office.

The search for oil and gas has accelerated research related to environmental assessment of the outer continental shelf and adjacent marine habitats in Alaska. Information on biological communities in winter are especially lacking in this area. This report describes an investigation of the distribution and abundance of marine birds wintering in the Kodiak Archipelago of Alaska. Forty-four species of seabirds and ten species of marine mammals were observed during the winter of 1979-1980 in the Kodiak Archipelago. The species composition of seabirds in the area shifted considerably between summer and winter. Densities in the bays increased in the winter, whereas densities over the continental shelf decreased.

PB82-146333 PC **A06**/MF **A01**
Texas A and M Univ., College Station. Dept. of Oceanography.
Proceedings: Annual Gulf of Mexico Information Transfer Meeting (2nd) Held in New Orleans, Louisiana, 1980.
Final rept.
Nov 81, 118p TR-81-5-T, BLM/YM/PT-82-001-3331
Contract DI-AA851-CT0-25

These Proceedings contain the presentations of the second annual Gulf of Mexico Information Transfer meeting sponsored by the Bureau of Land Management. The objectives of this meeting were to provide information supportive of the Gulf of Mexico oil and gas lease sales, identifying future environmental study needs, and furnishing a forum for scoping as required by the Council of Environmental Quality. Topics discussed included topographic features monitoring, reef fish populations, IXTOC oil spill damage assessment, Gulf of Mexico geology, recreational fisheries investigations, ecological mapping, deep sea biology, polychaete study, southwest Florida shelf study, satellite oceanography and circulation model, coastal ecological characterizations, and endangered species.

8B. Cartography

AD-A107 048/1 PC **A05**/MF **A01**
Army Engineer Topographic Labs., Fort Belvoir, VA.
Terrain Analysis Procedural Guide for Soil. Report Number 6 in the ETL Series on Guides for Army Terrain Analysts.
Technical rept.,
Janet S. Wright, Theodore C. Vogel, Alexander R. Pearson, and Jeffrey A. Messmore. Feb 81, 91p Rept no. ETL-0254

This report is one in a series of terrain analysis procedural guides being developed in support of the Topographic Support System (TSS). It was written specifically for a U.S. Army terrain analyst and presents the step-by-step methods needed for extraction, reducing, and recording soil information on a factor overlay and supporting data table. (Author)

AD-A107 380/8 PC **A02**/MF **A01**
Army Engineer Topographic Labs., Fort Belvoir, VA.
High-Speed Laser Platemaking from Digital Data for the Defense Mapping Agency.
6 Nov 81, 17p Rept no. ETL-R026

A Digital Laser Platemaker will significantly reduce the time and cost for producing standard and special purpose maps that are now printed by lithographic methods. This platemaker, developed at the U.S. Army Engineer Topographic Laboratories (USAETL) Ft. Belvoir, VA. will expose a 41- by 59-inch image on a diazocoated press plate in 15 minutes by using an Ultra Violet (UV) laser and digital data input via magnetic tape. Plates will be exposed while they are held on the internal surface of a stationary drum after it is loaded by a semi-automatic mechanism. The system can also produce film plots for archival storage of graphic images. (Author)

AD-A107 448/3 PC **A06**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Standardization of Map Symbology for Large Scale Maps.
Master's thesis,
Robert P. Jacober, Jr. 1979, 114p Rept no. AFIT-CI-79-317-T-S

This report investigates the subject of standardization of map symbology for large scale engineering maps and plans. It discusses such questions as, is there a need for standardization and what criteria should be used to design the symbols. For the purposes of this thesis, 'large scale maps' or 'engineering scale maps and plans' refer to maps produced between the scales of 20 feet to the inch (1:240) and 400 feet to the inch (1:4800). (Author)

N81-29495/1 PC **A07**/MF **A01**
Texas A and M Univ., College Station. Dept. of Mathematics.
Development of Advanced Acreage Estimation Methods.
Final Report, 1 Nov. 1979 - 31 Oct. 1980.
L. F. Guseman, Jr.. Dec 80, 133p E81-10160, NASA-CR-161004
Contracts NAS9-14689, PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of the Interior, and Agency for International Development. Erts.

The use of the AMOEBA clustering/classification algorithm was investigated as a basis for both a color display generation technique and maximum likelihood proportion estimation procedure. An approach to analyzing large data reduction systems was formulated and an exploratory empirical study of spatial correlation in LANDSAT data was also carried out. Topics addressed include: (1) development of multiimage color images; (2) spectral spatial classification algorithm development; (3) spatial correlation studies; and (4) evaluation of data systems.

8C. Dynamic Oceanography

AD-A106 914/5 Not available NTIS
Washington Univ., Seattle. Applied Physics Lab.
Experience with an Expendable Temperature and Velocity Profiler,
John H. Dunlap, Robert G. Drever, and Thomas B. Sanford. 1981, 5p
Availability: Pub. in Oceans, p372-376 Sep 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 041/6 PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
High Solitary Waves in Water: A Refined Numerical Method.
Interim rept.,
James M. Witting, and John M. Bergin. 30 Sep 81, 19p Rept no. NRL-8504

Formerly, finite difference calculations of solitary wave properties gave results different from those obtained from independent methods. Calculations based on an expansion in powers of a small quantity, supplemented by the use of Pade approximates, and calculations based on an integral equation for the wave profile are in satisfactory agreement, except possibly for the highest waves. This report refines and extends a numerical method based on Fourier series solutions of the governing equations. The resultant solitary wave properties agree with those found by independent methods to several significant figures, except for waves having amplitudes within a few percent of that of the highest wave. There appears to be little degradation in the method's accuracy for the highest and very high waves, when compared to waves of intermediate height. This report discusses possible reasons for the failure of other numerical work to achieve high accuracy. (Author)

AD-A107 205/7 PC **A02**/MF **A01**
Coastal Engineering Research Center, Fort Belvoir, VA.
Linearized Solution to Inlet Equation with Inertia.
Technical notes,
Todd L. Walton, Jr., and Francis F. Escoffier. 1981, 17p Rept no. CERC-REPRINT-81-9
Pub. in Jnl. of the Waterway, Port, Coastal and Ocean Div. of Army Coastal Engineering Research Center, n81-9 p189-204 1981. Proceedings of the American Society of Civil Engineers v107 nWW3 Aug 81.

No abstract available.

AD-A107 226/3 Not available NTIS
North Carolina Univ. at Chapel Hill.
Synoptic Observations of the Three-Dimensional Structure and Propagation of Gulf Stream Meanders Along the Carolina Continental Margin,
John M. Bane, Jr., David A. Brooks, and Karen R. Lorenson. 19 Sep 80, 15p
Contract N00014-77-C-0354, Grant NSF-OCE77-25682
Sponsored in part by Grant NSF-OCE79-06710.
Availability: Pub. in Jnl. of Geophysical Research, v86 nC7 p6411-6425, 20 Jul 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 241/2 PC **A02**/MF **A01**
Coastal Engineering Research Center, Fort Belvoir, VA.
Prediction of Wave Refraction and Shoaling Using Two Numerical Models.
Coastal engineering technical aid rept.,
Jon M. Hubertz. Aug 81, 16p Rept no. CERC-CETA-81-12

Two numerical models to predict wave refraction and shoaling in shallow water are described. One model is formulated in terms of wave rays, the other in terms of wave spectra. Output from each model is illustrated and compared to observations made at CERC's Field Research Facility at Duck, North Carolina. (Author)

AD-A107 343/6 PC **A02**/MF **A01**
Coastal Engineering Research Center, Fort Belvoir, VA.
Linearized Solution to Inlet Equation with Inertia. Stability of Rubble Mound Breakwaters. Particle Motion under Stokes Waves.
Technical notes,
Todd L. Walton, Jr., Eliezer Kit, J. Richard Weggle, Francis F. Escoffier, and Michael Stiassnie. 1981, 17p Rept no. CERC-R-81-10
Pub. in Jnl. of the Waterway, Port, Coastal and Ocean Division, v107 nWW3 p189-204 Aug 81.

No abstract available.

PB82-134099 PC **A03**/MF **A01**
National Oceanic and Atmospheric Administration, Boulder, CO. Wave Propagation Lab.
Circulation and Trajectory Calculations in the Eastern Strait of Juan de Fuca Using a CODAR System,
A. S. Frisch, and B. L. Weber. May 81, 29p EPA-600/7-81-089

During the summer of 1978 and 1979, the surface currents of the Eastern Strait of Juan de Fuca were mapped with a high frequency radar system. This system measures surface currents over several hundred square kilometers. In this study, the authors have used data from both years to make a composite picture of the tidal flow over an area covered by the radar in all the experiments. In addition, because of the potential impact from an oil leak along the path of a proposed oil pipeline, the authors have simulated a continuous release of a material and computed a trajectory for a no-wind condition.

PB82-139411 PC **E04**/MF **A01**
Woods Hole Oceanographic Institution, MA.
A Compilation of Moored Instrument Data and Associated Hydrographic Observations. Volume XXVIII (Polymode Local Dynamics Experiment, 1978-1979).
Technical rept.,
Carol A. Mills, Susan A. Tarbell, and Richard E. Payne. Aug 81, 58p WHOI-81-73
Grant NSF-OCE77-19403
See also Volume 24, AD-A093 308.

Summaries are presented of ocean current velocities, pressures and temperatures recorded by instruments in the POLYMODE Local Dynamics Experiment (LDE) moored array. The LDE array comprised 28 current meters and 15 temperature-pressure recorders on 9 moorings deployed for 15 months in the vicinity of 31 degrees N, 69 degrees 30 min W from April 1978 to July 1979. Summaries of the ten CTD hydrographic stations made on the array recovery cruise are also presented.

PB82-141888 PC **A99**/MF **A01**
Science Applications, Inc., La Jolla, CA.
South Atlantic OCS Physical Oceanography, Year II. Volume III: Data Products, Part I.
Final rept.
Jan 81, 689p BLM/YL/ES-81/03
Contract DI-AA551-CT8-52
See also Volume 2, PB82-141870, and Volume 3, Part 2, PB82-141896.
Also available in set of 4 reports PC E99, PB82-141854.

The report presents data products created as part of each major task associated with the second year effort on the South Atlantic Bight, Physical Oceanography Study. These figures given in the report are associated with the following tasks: Gulf Stream variability, Remote sensing and hydrography of the South Atlantic Bight.

PB82-141896 PC **A17**/MF **A01**
Science Applications, Inc., La Jolla, CA.
South Atlantic OCS Physical Oceanography, Year II. Volume III: Data Products, Part II.
Final rept.
Jan 81, 380p BLM/YL/ES-81/04
Contract DI-AA551-CT8-52
See also Volume 3, Part 1, PB82-141888.
Also available in set of 4 reports PC E99, PB82-141854.

The report presents data products created as part of each major task associated with the second year effort on the South Atlantic Bight, Physical Oceanography Study. Figures are given on ocean current measurements and ocean temperature.

8D. Geochemistry

ORO-3852-39 PC **A03**/MF **A01**
Texas A and M Research Foundation, College Station.
Distribution of Actinide Elements in Sediments: Leaching Studies.
M. R. Scott, and P. F Salter. 40p
Contract AS05-76EV03852

Previous investigations have shown that Fe and Mn oxides and organic matter can significantly influence the behavior of Pu and other actinides in the environment. A sequential leaching procedure has been developed in order to investigate the solid phase distribution of the actinides in riverine and marine sediments. Seven different sedimentary fractions are defined by this leaching experiment: an exchangeable metals fraction, an organic fraction, a carbonate fraction, a Mn oxide fraction, an amorphous Fe fraction, a crystalline Fe oxide fraction and a lattice-held or residual fraction. There is also the option of including a metal sufide fraction. A preliminary experiment, analyzing only the metals and not the actinide elements, indicates that this leaching procedure (with some modifications) is a viable procedure. The subsequent data should result in information concerning the geochemical history and behavior of these actinide elements in the environment. (ERA citation 05:032893)

8E. Geodesy

AD-A107 285/9 PC **A02**/MF **A01**
Coastal Engineering Research Center, Fort Belvoir, VA.
Fast, Accurate Two-Person Beach Surveys.
Coastal engineering technical aid rept.,
William A. Birkemeier. Aug 81, 19p Rept no. CERC-CETA-81-11

Generally, the most accurate beach survey data are obtained using a surveying level to determine elevation and a tape to measure distance; however, this procedure requires a minimum of three people. Commonly used two-person surveying procedures are stadia surveying and the Emery method. In stadia surveying, a level is used to determine elevation; distance is indirectly determined by two additional readings of the level rod. This method gives the same elevation accuracy of level and tape surveying, but requires careful readings of the level rod to obtain accurate distances. The Emery method uses two 5-foot calibrated rods and the horizon to measure distances to, and changes in elevation between, two survey points. Errors are additive and large elevation errors are possible particularly on wide benches. This report discusses a modified stadia surveying procedure which, when used properly, is fast and produces data of comparable accuracy to level and tape surveying. Because more readings are taken (three per survey point), the data provide a higher degree of confidence than is available with the other methods. The modifications include the addition of two stakes to the profile line monumentation, pacing the distance between each point, and performing a simple mental field check of data quality. Using the stadia method, a typical profile of 10 to 15 survey points can be surveyed in 15 to 20 minutes including instrument setup time. (Author)

AD-A107 379/0 PC **A02**/MF **A01**
Defense Mapping Agency, Washington, DC.
Inertial Surveying Technology.
Final rept.,
Armando Mancini. 14 Nov 81, 18p

Inertial Surveying is the process of ascertaining position and gravity field parameters from measured accelerations. Typically, the observer traverses the survey course in a vehicle such as a van or helicopter and operates instrumentation which records the vehicle's acceleration history as the survey proceeds. The instrumentation, similar to that used for inertial navigation, consists of very accurate and precise accelerometers, gyros, data recording equipment, a computer, and support electronics. The gyros provide a precise reference frame for the acceleration measurements. The computer integrates the acceleration measurements into velocity and position data to provide a real-time display during the traverse and stores information for later post-survey processing (smoothing). The general theory, operations, system description and results will be presented. (Author)

N82-11696/3 PC **A02**/MF **A01**
Smithsonian Astrophysical Observatory, Cambridge, MA.
Study of the Time Evolution of the Lithosphere.
Semiannual Progress Report, 1 Mar. - 31 Aug. 1981.
M. C. Roufosse. Nov 81, 7p NASA-CR-164968, SAPR-1
Contract NAG5-150

A three dimensional geoid of all oceanic regions was obtained using a data set derived from the GEOS-3 radar altimeter. The editing and organization of the complete SEASAT geophysical data set are described. The geographical area located between 25 and 35 degrees south, and between 320 and 335 degrees east, around the Rio Grande Rise in the south Atlantic, was selected for continued study.

8F. Geography

AD-A107 497/0 PC **A02**/MF **A01**
Coastal Engineering Research Center, Fort Belvoir, VA.
Recent Geologic History of a Barrier Island,
Richard D. Hobson, Robert K. Schwartz, and Frank R. Musialowski. 1980, 15p Rept no. CERC-REPRINT-81-8
Pub. in Proceedings of the Conference Coastal Zone 1980, p850-862 1980.

No abstract available.

8G. Geology and Mineralogy

AD-A107 027/5 PC **A02**/MF **A01**
Hawaii Inst. of Geophysics, Honolulu.
Crustal Structure of the Shatsky Rise from Seismic Refraction Measurements,
J. F. Gettrust, K. Furukawa, and L. W. Kroenke. 26 Jul 78, 6p Rept no. HIG-CONTRIB-1070
Contract N00014-75-C-0209
Pub. in Jnl. of Geophysical Research, v85 nB10 p5411-5415, 10 Oct 80.

No abstract available.

AD-A107 044/0 PC **A04**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Geothermal Potential on Kirtland Air Force Base Lands, Bernalillo County, New Mexico.
Contractor rept.,
P. R. Grant, Jr. Oct 81, 65p Rept no. SAND81-7141
Contract DE-AC04-76DP00789
Prepared in cooperation with Energy Resources Exploration, Inc., Albuquerque, NM, and California Univ., Livermore, Rept. no. UC-66.

Public policy expressed in a number of national directives in recent years stresses the conservation of conventional fuel supplies, a switch to alternative fuels, and the application of advanced energy technologies at federal installations. Natural gas currently furnishes 85 to 95 percent of the average 94 x 1,000,000 Btu/hr energy requirements for space heating and cooling at Kirtland Air Force Base. Studies of alternatives to the use of natural gas at the base include examination of the geothermal option. Four of North America's major physiographic provinces coalesce in central New Mexico on or near Kirtland AFB. Their junction is identified throughout much of this region by a tectonic depression occupied by the Rio Grande that is structurally complex, stratigraphically and hydrologically unique, and coincides with geologically recent volcanic centers. This trough, the Rio Grande rift, has been identified as a major geothermal resource area. The western part of Kirtland AFB is in the Albuquerque Basin segment of the Rio Grande rift. Extensive sampling and geochemical analysis of groundwater in and near the base disclosed no significant geothermal parameters. However, structural conditions and current hydrologics regimes strongly suggest that thermal waters would be masked by near surface, low temperature meteoric water originating as rain and snowfall in the nearby mountains.

AECL-6404 PC **A13**/MF **A01**
Atomic Energy of Canada Ltd., Chalk River (Ontario). Chalk River Nuclear Labs.
Hydrogeological and Geochemical Studies in the Perch Lake Basin. A Second Report of Progress.
P. J. Barry. Aug 79, 295p CONF-7804180-1
Symposium on hydrology and geochemistry of the Perch Lake Basin, Chalk River, Ontario, Canada, 25 Apr 1978.
U.S. Sales Only.

The Perch Lake basin is a small drainage system along the Ottawa River about 200 km west of Ottawa on the Canadian Shield. Since 1975, groups of scientists from several Canadian universities and government departments have been studying the hydrological, geological and geochemical properties of the basin. The object of these studies is to develop and test simulation models used to describe the time-dependent mass flow rates of water and dissolved and suspended substances through the basin. To review progress, a symposium/workshop was held at Chalk Rier in 1978 April. This report contains 24 extended summaries of the material presented verbally at the workshop. Subject matters include atmospheric sources and sinks, mass flows through the surface and subsurface regimes in the drainage basins and interactions occurring in the lake. (Atomindex citation 11:540844)

DE82000227 PC **A02**/MF **A01**
Maine Office of Energy Resources, Augusta.
Peat Resource Evaluation: State of Maine. Report for the Quarter Ending August 1981.
J. Davis, and W. Anderson. 1981, 7p DOE/FC/14690-T1
Contract FG18-79FC14690

The DOE/Maine Peat Resources Evaluation Program has been undertaken to determine the amount and location of fuel-grade peat that may be harvested and utilized in an environmentally acceptable manner in Maine. The resources inventory will provide a detailed evaluation of the peat deposits including maps showing areal extent, thickness, and distribution of peat, stratigraphic cross sections, and surficial mapping. Many deposits visited by earlier investigators had to be re-visited to more accurately assess the physical characteristics of the deposits and to obtain laboratory samples. Representative samples from surveyed deposits are obtained through standard field sampling techniques. (ERA citation 06:034251)

DE82000388 PC **A08**/MF **A01**
Monsanto Research Corp., Miamisburg, OH.
Evaluation of Resource-Assessment Values and in-Situ Combustion Potential for the OH-4 and PA-3 Wells. Final Report.
R. E. Zielinski, and R. D. McIver. 24 Jul 81, 158p
MLM-MU-81-67-0008, GRI-79-0110
Contract AC04-76DP00053

The OH-4 and PA-3 wells provided the first direct comparison of resource assessment methods for estimating free hydrocarbon gas contents in the Devonian shales. For the first time, the pressure core barrel was successfully utilized in a shale formation. A comparison of the three methods of resource assessment indicated that the conventional method employed for most cored wells has provided a significantly conservative estimate of resource and has not provided any offgassing rate data. The pressure core barrel method provided the ultimate in gas resource values; however, the controlled offgassing method employed on these wells provided relevant data. Geochemical analysis of OH-4 and PA-3 samples indicated that the shale in this area is atypical of the Devonian Shale from other Appalachian wells. The shale in these wells is moderately immature and oil prone; however, it has significant hydrocarbon gas content. These characteristics indicate that this shale might be combustion. A conventional mud-logger employed during the drilling had serious shortcomings. (ERA citation 06:034296)

DE82000517 PC **A05**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Analysis of Data from Line-Source Thermal-Conductivity Measurements Taken in Situ in Dome Salt at the Avery Island Mine.
D. F. McVey. Aug 81, 79p SAND-81-1232
Contract AC04-76DP00789

In-situ thermal conductivity was measured in dome salt at the Avery Island Mine by use of a line source thermal conductivity probe. The thermal conductivity was determined to be 5.8 W/m-K at about 26 exp 0 C and 5.6 W/m-K at about 31 exp 0 C. Because the influence of contact resistance and two-dimensional effects prevented the temperature rise from attaining the log-time linear asymptote classically used to analyze line source probe data, a new data reduction procedure using parameter estimation techniques was developed. The procedure obtains a least-squares-best-fit of a classic line source integral solution to the non-

linear early time temperature data. In the fit, contact resistance and thermal conductivity are free parameters. The technique removes many of the classic assumptions that restrict the usefulness of line source probes for in situ measurements. (ERA citation 06:035530)

LBL-10166(Rev.) PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Chemistry of Silica in Cerro Prieto Brines.
O. Weres, and L. Tsao. Feb 80, 19p CONF-7910166-6(Rev.)
Contract W-7405-ENG-48
Symposium on the Cerro Prieto Geothermal Field, Baja California, Mexico, 17 Oct 1979.

The precipitation of amorphous silica from synthetic geothermal brines that resemble the flashed brine at Cerro Prieto was studied. It was found that part of the dissolved silica quickly polymerizes to form suspended colloidal silica. The colloidal silica flocculates and settles slowly at unmodified brine pH values near 7.35. Raising the pH of the brine to about 7.8 by adding base and stirring for a few minutes causes rapid and complete flocculation and settling. These results have been confirmed in the field using actual Cerro Prieto brine. Several commercially available flocculating agents were also tested. Both in the laboratory and in the field, it was found quaternary amines to be effective with some brine compositions but not with others. Polyacrylamides do not work at all. These results suggest the following simple preinjection brine treatment process: age the brine for 10 to 20 minutes in a covered holding tank, add 20 to 30 ppm lime (CaO), stir for 5 minutes, and separate the flocculated silica from the brine using a conventional clarifier. The brine coming out of such a process will be almost completely free of suspended solids. The pilot plant tests needed to reduce this conceptual process to practice are discussed. In a separate study, the rate of deposition of silica scale from synthetic brines was researched. It was found that a modest decrease in pH could significantly reduce the scaling rate at a reasonable cost. (ERA citation 05:028856)

LBL-10540 PC **A02**/MF **A01**
GeoResources Associates, Napa, CA.
Subsurface Geological and Geophysical Study of the Cerro Prieto Geothermal Field.
D. J. Lyons, and P. C. van de Kamp. May 80, 17p CONF-7910166-14
Contract W-7405-ENG-48
Symposium on the Cerro Prieto Geothermal Field, Baja California, Mexico, 17 Oct 1979.

This subsurface investigation of the Cerro Prieto field and surrounding area was undertaken to provide information on its stratigraphy, structure, hydrothermal alteration, and reservoir properties for use in designing reservoir simulation models and planning development of the field. Another objective was to gain insight into the depositional, tectonic, and thermal history of the Cerro Prieto area. The following types of data were used in this study: (1) well sample descriptions and analyses (x-ray diffraction, petrography, and porosity-permeability); (2) well logs (spontaneous potential, resistivity, gamma-ray, density, sonic and caliper; (3) geophysical surveys (resistivity, gravity, magnetics, refraction seismic, reflection seismic, and seismicity); (4) physiography (modern depositional patterns and surface manifestations of faults); and (5) regional geology. The detailed interpretation of the subsurface geology presented should be useful for field development. (ERA citation 05:033554)

LBL-9546 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Intersecting Faults and Sandstone Stratigraphy at the Cerro Prieto Geothermal Field.
S. Vonder Haar, and J. H. Howard. Feb 80, 15p CONF-7910166-11
Contract W-7405-ENG-48
Symposium on the Cerro Prieto Geothermal Field, Baja California, Mexico, 17 Oct 1979.

The northwest-southeast trending Cerro Prieto fault is part of a major regional lineament that extends into Sonaro and has characteristics of both a wrench fault and an oceanic transform fault. The distribution of lithologies and temperature within the field was studied by comparing data from well cuttings, cores, well logs, and geochemical analyses. Across the earliest developed portion of the field, in particular along a 1.25-km northeast-southwest section from well M-9 to M-10, interesting correlations emerge that indicate a relationship among lithology, microfracturing, and temperature distribution. In the upper portion of Reservoir A of this stratigraphic section, between 1200 and 1400 m, the percentage of sandstones ranges from 20 to 55. Temperatures are 225 exp 0 to 275 exp 0 C based on well logs, calcite isotope maxima, and Na-K-Ca indices. The study shows that an isothermal high in this vicinity corresponds to the lowest total percentage of sandstones. Scanning electron microphotographs of well cores and cuttings from sandstone and shale units reveal clogging, mineral dissolution, and mineral precipitation along microfractures. The working hypothesis is that these sandy shale and siltstone facies are most amenable to increased microfracturing and, in turn, such microfracturing allows for higher temperature fluid to rise to shallower depths in the reservoir. (ERA citation 05:032086)

METC/CR-79/26 PC **A03**/MF **A01**
Department of Energy, Morgantown, WV. Morgantown Energy Technology Center.
Procedures for Petrophysical, Mineralogical and Geochemical Characterization of Fine-Grained Clastic Rocks and Sediments.
E. B. Nuhfer, J. A. Florence, J. L. Clagett, J. J. Renton, and R. R. Romanosky. Aug 79, 41p
Contract EY-76-C-05-5199

The methods result from about four years of study of shales and recent fine-grained muds and are suitable for rapidly processing large numbers of samples cheaply and quickly with very good precision. Density and porosity measurements sufficient to provide good between-sample comparisons of shales with only about 1 or 2% porosity are possible using equipment found in most laboratories providing that attention is given to sources of small errors and suitable immersion fluids are used. Mineralogical composition can be precisely characterized by x-ray diffraction, providing that a careful sample preparation scheme is adhered to. Such precision can be maintained on samples as small as 20mg in size. Elemental analyses are better performed on high-temperature ash remaining after loss-on-ignition than on original whole sample. Complete chemical analyses of major, minor, and many trace elements can be obtained on sample sizes as small as 20mg of ash. Precision afforded by mineralogical and chemical methodology is sufficient to allow merging of data from these two sources for statistical analyses. Presence of significant amounts of x-ray-amorphous mineraloids is now thoroughly documented in recent muds and is possibly present in many shales. (ERA citation 05:000186)

N82-11492/7 PC **A04**/MF **A01**
JAYCOR, Woburn, MA.
A Review of an Attempt to Create Shatter Cones with Magnetic Flyer Plate Technology.
Final Report, 28 Nov. 1979 - 28 Nov. 1980.
H. J. Linnerud. 8 Apr 81, 73p NASA-CR-164614, J206-81-005-FR
Contract NASW-3328

The feasibility of creating shatter cones in a controlled laboratory environment is discussed. Magnetic flyer plate technology, which generates high amplitude shock waves in test materials is discribed. Considerable sample shear and break up was observed, however, no shatter cones are found in the tested samples.

N82-11691/4 PC **A03**/MF **A01**
Lunar and Planetary Inst., Houston, TX.
Workshop on Early Crustal Genesis: Implications from Earth.
W. C. Phinney. 1981, 48p NASA-CR-164944, LPI-TR-81-04
Contract NASW-3389
Workshop Held at Houston, Tex., 3-5 Nov. 1980.

Ways to foster increased study of the early evolution of the Earth, considering the planet as a whole, were explored and recommendations were made to NASA with the intent of exploring optimal ways for integrating Archean studies with problems of planetary evolution. Major themes addressed include: (1) Archean contribution to constraints for modeling planetary evolution; (2) Archean surface conditions and processes as clues to early planetary history; and (3) Archean evidence for physical, chemical and isotopic transfer processes in early planetary crusts. Ten early crustal evolution problems are outlined.

N82-11694/8 PC **A02**/MF **A01**
California Inst. of Tech., Pasadena.
Hotspots, Polar Wander, Mesozoic Convection and the Geoid.
D. L. Anderson. 10 Nov 81, 19p NASA-CR-164943
Grant NSG-7610
Revised.

The geoid bears little relation to present tectonic features of the earth other than trenches. The Mesozoic supercontinent of Pangea, however, apparently occupied a central position in the Atlantic-African geoid high. This and the equatorial Pacific geoid high contain most of the world's hotspots. The plateaus and rises in the western Pacific formed in the Pacific geoid high and this may have been the early Mesozoic position of Pacifica, the fragments of which are now the Pacific rim portions of the continents. Geoid highs which are unrelated to present subduction zones may be the former sites of continental aggregations and mantle insulation and, therefore, hotter than normal mantle. The pent-up heat causes rifts and hotspots and results in extensive uplift, magmatism, fragmentation and dispersal of the continents and the subsequent formation of plateaus, aseismic ridges and seamount chains. Convection in the uppermantle would then be due to lateral temperature gradients as well as heating from below and would be intrinsically episodic.

ONWI-95 PC **A05**/MF **A01**
Terra Tek, Inc., Salt Lake City, UT.
Review of Current Capabilities for the Measurement of Stress, Displacement, and in Situ Deformation Modulus.
T. W. Schrauf, and H. R. Pratt. Dec 79, 88p
Contract AC06-76RL01830

Current capabilities for the measurement of stress, displacement, and in situ deformation modulus in rock masses are reviewed as to their accuracy, sensitivity, advantages, and limitations. Consideration is given to both the instruments themselves and the measurement technique. Recommendations concerning adaptation of existing measurement techniques to repository monitoring are also discussed. These recommendations include: (1) development of a modified borehole deformation gage with improved long-term stability and reliability and reduced thermal sensitivity; (2) development of a downhole transducer type of extensometer; (3) development of a rigid inclusion type gage; (4) development of an improved vibrating wire stressmeter with greater accuracy and simplified calibration and installation requirements; and (5) modification of standard rod extensometers to improve their sensitivity. (ERA citation 05:034226)

PB82-109273 PC **A03**/MF **A01**
Geological Survey, Reston, VA.
A Summary of Environmental Geologic Studies on the Southeastern United States Atlantic Outer Continental Shelf, 1977-1978.
Open file rept. (Final),
Peter Popenoe. 1981, 48p OPEN FILE-81-583, BLM/YL/SR-81/03
DI-AA5551-MU8-13
See also PB82-109265.

The general purpose of the Bureau Land Management (BLM), Environmental Studies Program is: (1) to provide information about the Outer Continental Shelf environment that will enable them to make sound management decisions regarding the development of mineral resources; and (2) acquire information which will enable BLM to answer questions about the impact of oil and gas exploration. The comprehensive final report summarizes in detail the methods, techniques, instruments, and procedures utilized in accomplishing these objectives, and the results, interpretations, and conclusions based thereon.

PB82-132127 PC **A04**/MF **A01**
Rice Univ., Houston, TX.
Marine Sediment Core Descriptions IWSOE 68, 69, 70; Deep Freeze 79,
John B. Anderson, Susan B. Davis, Eugene W. Domack, Dennis D. Kurtz, and Kathy M. Balshaw. Jan 81, 66p ANTARCTIC BIBLIOGRAPHY-J-24423
Grants NSF-DPP77-26407, NSF-DPP79-08242

The polar seas represent one of the most complex and also the most poorly understood marine sedimentary environments. Antarctica provides the only modern glacial marine environment where large ice shelves exist and where the ice sheet is still grounded on the seafloor. These large glacial features undoubtedly play a key role in glacial marine sedimentation. The present

manual includes descriptions of these materials along with descriptions of sediment grab samples and piston cores obtained during the Deep Freeze 79 expedition to the d'Urville Sea.

PB82-132879 PC **A02**/MF **A01**
Rice Univ., Houston, TX.
The Scientific Program USCGC Glacier Deep Freeze 80,
John B. Anderson, and Dennis D. Kurtz. Feb 80, 21p
ANTARCTIC BIBLIOGRAPHY-E-23364
Grants NSF-DPP77-26407, NSF-DPP79-08242

On 12/19/79 the USCGC Glacier left Auckland, New Zealand to conduct marine geologic investigations in the valley glacial-marine sedimentary environments bordering the Transantarctic Mountains. The objectives of the report were: (1) to occupy closely spaced geologic stations along the Pennell Coast, in Terra Nova Bay, and in McMurdo Sound; (2) to conduct a reconnaissance study of other portions of the western Ross Sea; (3) to conduct bathymetric surveys in uncharted waters; (4) to sample ice-rafted detritus from icebergs and floating ice; and (5) to chart the current positions of ice tongues and glacier termini using the ships radar.

PB82-134503 PC **A05**/MF **A01**
Maine Univ. at Orono.
USCGC GLACIER 1976 and 1978 Cruises. Rose Sea, Antarctica Sediment Descriptions,
Thomas B. Kellogg, Davida E. kellogg, Kevin R. Melanson, and Kathryn G. Austin. 1981, 81p
ANTARCTIC BIB-E-25202
Grant NSF-DPP79-20112
Also pub. as Florida State Univ., Tallahassee. Sedimentological Research Lab. Contrib-49.

The icebreaker collected 36 piston cores and 32 trigger cores from 39 stations. Most cores were taken north of Ross Island, next to the Ross Ice Shelf, and along the 1,000-meter depth north of the Ross Ice Shelf. Longest core is 1,077 centimeters; most are half that length or less. Objectives were to determine the climatic and oceanic history of the region and the west antarctic ice sheet.

PB82-135344 PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Reproducibility of Joint Spacing Measurements in Rock,
V. J. Ewan, G. West, and J. Temporal. c1981, 31p
TRRL-LR-1013
Also pub. as ISSN-0305-1293.

An investigation has been made into the reproducibility of measurement of joint spacing in rock. The rocks studied were sandstone, mudstone and limestone exposed in the Kielder Aqueduct Tunnels; the same limestone exposed in a nearby quarry was also studied. Joint spacing measurements made on site were also compared with measurements made from stereophotographs. It was found that for six observers measuring a 10m long scanline, the number of joints recorded can vary by up to a factor of nearly four without there being any real difference in the joint spacing of the rock. Measurements made from stereophotographs showed more joints than measurements made on site. When the joint spacing results were used to assign the rocks to recognized joint spacing classification categories, the results never varied by more than two adjacent categories, suggesting that the effects of the variation may not be so serious from the engineering classification standpoint. This was confirmed when it was found that the variation does not affect the overall rating of the rock mass using the Bieniawski rock mass classification. (Copyright (c) Crown Copyright 1981.)

PB82-139403 PC **A04**/MF **A01**
Woods Hole Oceanographic Institution, MA.
St. Peter and St. Paul's Rocks (Equatorial Atlantic) and the Surrounding Sea Floor.
Technical rept.,
Geoffrey Thompson. Nov 81, 54p WHOI-81-98
Grants NSF-OCE77-26842, NSF-OCE80-24930

This report gives details on the sampling locations, rock types recovered and bathymetry and morphology of the islets of St. Paul's Rocks (Equatorial Atlantic) and the surrounding sea floor. This work was done during Cruise 35 of R/V CHAIN, and Cruise 20 of R/V ATLANTIS II, 1965.

PB82-802570 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Remote Sensing Applied to Geology and Mineralogy. 1973-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1973-Nov 81.
Dec 81, 212p
Supersedes PB80-813124, and NTIS/PS-79/0844.

The use of LANDSAT satellites (formerly Earth Resources Technology Satellites (ERTS)) and other remote sensing methods in geological and mineralogical applications is discussed. Abstracts cover rock and soil mapping, terrain analysis, direct and indirect mineral exploration, fault tectonics, and general geologic studies of various countries. A few abstracts pertain to equipment and techniques used in the studies. (This updated bibliography contains 204 citations, 17 of which are new entries to the previous edition.)

PB82-858028 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Meteorites. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for Jan 75-Dec 81.
Dec 81, 93p

Citations in this bibliography cover principles, observations, and interpretations of the mineralogy and petrology of various types of meteorites. Considerable attention is given to specific meteorites recovered from worldwide sources. (Contains 77 citations fully indexed and including a title list.)

PB82-858614 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Rock Mechanics. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for Jan 75-Dec 81.
Dec 81, 114p

This bibliography cites reports which relate to theoretical, experimental, and field investigations and analyses of the mechanical properties and behavior of rocks in general, and of some specific rock types and rock formations in particular. Various types of stress and strain phenomena are considered. (Contains 95 citations fully indexed and including a title list.)

8H. Hydrology and Limnology

AD-A106 929/3 PC **A07**/MF **A01**
Geological Survey, Tallahassee, FL. Water Resources Div.
Water-Resources Information for the Withlacoochee River Region, West-Central Florida.
Final rept. 1980-1981,
Robert A. Miller, Warren Anderson, Anthony S. Navoy, James L. Smoot, and Roger G. Belles. Aug 81, 143p Rept nos. USGS/WRI-81-11, USGS/WRD/WRI/81-087

The ground-water system in the Withlacoochee River region is comprised of up to three different aquifers--the surficial, the secondary artesian, and the Floridan. Little is known about the surficial and secondary artesian aquifers. The Floridan aquifer consists mostly limestones and dolomites, and is as much as 1,500 feet thick. Transmissivities are known to be as high as 25 million feet squared per day. The quality of water within the Floridan aquifer is generally excellent except in two areas where saltwater is present. The majority of the streams have average dissolved-solids concentrations between 100 and 200 milligrams per liter, maximum-observed specific conductance between 250 and 750 micromhos per centimeter, and average total nitrogen concentrations of less than 1.2 milligrams per liter. Summaries were compiled of more than 1,000 wells, 43 continuous-record gaging stations, 21 lakes, and 46 springs. (Author)

AD-A106 977/2 PC **A02**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
Bottom Heat Transfer to Water Bodies in Winter.
Special rept.,
Kevin O'Neill, and George D. Ashton. Sep 81, 12p
Rept no. CRREL-SR-81-18

In many surface water bodies, water temperature closely follows ambient air temperature. This means that warmer water in winter absorbs heat from below. The extent and pattern of winter heat gain is constrained by the fact that the water temperature does not fall below the freezing point. On the basis of a few simple assumptions, governing equations are solved here pertaining to heat flow in bottom sediments. The results are presented in general nondimensionalized curves. These allow estimation of water/sediment heat flux for any particular case, given truncation of the water temperature curve at the freezing point. The user must supply pertinent yearly air temperature mean and amplitude of variation, together with the thermal diffusivity for the bottom material. The governing equations are solved using a higher order finite element method which solves directly for temperature gradients and hence for heat flux. Thus the method provides particularly accurate flux values at high efficiency. The results illustrate in detail how winter water heat gain is less in cases where mean air temperatures are lower. (Author)

AD-A107 049/9 PC **A02**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
Limnological Investigations: Lake Koocanusa, Montana. Part 5. Phosphorus Chemistry of Sediments.
Special rept.,
I. K. Iskandar, and S. S. Shukla. Jul 81, 14p Rept no. CRREL-SR-81-15

This study characterizes the sediments from Lake Koocanusa (Libby Dam reservoir), Montana, in terms of their ability to sorb and release P. Sediment samples were collected at 12 stations located between the U.S.-Canadian border and Libby Dam (42 miles downstream of the border) during July 1977. The sediments from Lake Koocanusa are calcareous, low in organic matter (< 2.3%), and have a silty loam or loam texture. Most of the P associated with these sediments was in the inorganic form (> 85%), which was highly correlated (r = 0.89) with oxalate extractable Fe in the sediment. Sorption tests, with concentrations of either 1000 or 10,000 micrograms P/g sediments, showed that these sediments have limited ability to sorb additional P from concentrated solutions. The maximum amount sorbed at the lower P concentrations was 67% of the added P and was highly correlated with oxalate extractable Fe in the sediments. Desorption studies showed that very small amounts of both the originally bound P (1 to 2%) and the added P (< 6.3%) were released. Conclusion: the sediments in Lake Koocanusa act as a P sink. (Author)

AD-A107 077/0 PC **A02**/MF **A01**
Hydrologic Engineering Center, Davis, CA.
Guidelines for Calibration and Application of STORM Addendum. Description of SCS Method of Runoff Determination as Programmed in STORM.
Training document
Robert J. Cermak. Sep 80, 14p Rept no. HEC-TD-8-ADD
Addendum to report dated Dec 77, AD-A106 701.

No abstract available.

DE81031984 PC **A07**/MF **A01**
Oak Ridge Associated Universities, Inc., TN.
Hydrologic Study of the Unsaturated Zone Adjacent to a Radioactive-Waste Disposal Site at the Savannah River Plant, Aiken, South Carolina.
P. Gruber. 1980, 136p DOE/TIC-11491
Contract AC05-76OR00033
Thesis.

Unsaturated hydraulic conductivity as a function of soil-water content and soil-water pressure head of field soils in the vicinity of a low-level radioactive-waste disposal site was measured for a period of 28 days following steady-state infiltration. Tensiometer and a neutron probe measurements were replicated four times at various depth intervals of from 12.0 to 120.00 inches below land surface in two 12 foot square plots. Values of soil-water content, soil-water flux, and hydraulic conductivity at each depth were calculated during the period of drainage using a computer program called SOIL. After drainage of soil-water through the 120 inch profile ceased, duplicate undisturbed soil cores from opposite sides of each plot and from disturbed and un-

disturbed sites within the burial grounds were recovered and subjected to pressure-plate analysis for the calculation of unsaturated hydraulic conductivity. Laboratory analyses also included the determination of soil bulk density, particle-size distribution, and saturated hydraulic conductivity. Calculation of unsaturated hydraulic conductivity in the laboratory was made using a computer program called HYDRO, based upon the relationship of the soil-water content/soil-water pressure curve. Soils in the study area and the burial ground exhibited similar physical and hydrologic characteristics. Field derived hydraulic conductivity correlated well with laboratory derived conductivity. Variability of soil characteristics due to burial operations were minimal when compared to undisturbed natural soils in the study area. Two textural discontinuities were found to exist in the soil profile at depths of 12 to 24 inches and at 130 inches, which inhibit soil-water movement and thereby reduce the quantity and rate of recharge to the underlying water-table aquifer. (ERA citation 06:034399)

LA-8461-MS PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Geohydrology of Bandelier National Monument, New Mexico.
W. D. Purtymun, and H. Adams. Jul 80, 28p
Contract W-7405-ENG-36

Bandelier National Monument is located on the eastern slopes of the Sierra de los Valles and the Pajarito Plateau. The Pajarito Plateau was formed by a series of ashflow and ashfall of rhyolite tuff. Perennial and intermittent streams have cut the surface of the plateau into a number of narrow southeast-trending mesas separated by deep canyons. Perennial surface flow occurs in Canon de los Frijoles and in the upper and middle reaches of Alamo, Capulin, Medio, and Sanchez Canyons. Of the five springs in and adjacent to the Monument, three discharge from perched aquifers and two from the main aquifer. Water in the deep main aquifer moves south to southeast in the Monument. Along the western edge of the Monument, the intrusion of volcanic rock of the San Miguel Mountains forms a barrier to the movement of water from the recharge area in the Valles Caldera. About 46.4 km exp 2 of the drainage area in the upper and middle reaches of Canon de los Frijoles, Alamo, Lummis and Capulin Canyons were burned over by a wildfire (the La Mesa Fire) in June 1977. The geohydrology of the area was determined to assess the availability of surface and ground water in the Monument and to determine the impact of the wildfire on these water resources. (ERA citation 05:032884)

PB82-107137 PC **A09**/MF **A01**
New England River Basins Commission, Boston, MA.
Androscoggin River Basin Overview.
Sep 81, 195p
Sponsored in part by Water Resources Council, Washington, DC.

The Androscoggin River basin drains 3,450 square miles in New Hamphsire and Maine. River flows are largely controlled by dams at six headwater lakes. Major water resource problems in the basin include competing demands for fisheries, recreation, and new hydropower development. The report recommends a river basin management study to meet multiple objectives.

PB82-107145 PC **A08**/MF **A01**
New England River Basins Commission, Boston, MA.
Piscataqua and New Hampshire Coastal River Basins Overview.
Mar 80, 173p
Sponsored in part by Water Resources Council, Washington, DC.

The Piscataqua River and New Hampshire Coastal rivers drain 1,083 square miles in New Hampshire and Maine. Water resource problems associated with the high rate of population growth in the basins include insufficient water supply and the need to protect supply sources, nonpoint source pollution, and the need to protect significant natural, coastal resources. The report recommends further identification and analysis of interstate water resource issues.

PB82-108101 PC **A08**/MF **A01**
New England River Basins Commission, Boston, MA.
Lake Memphremagog-St. Francis River Basin Overview.
May 81, 166p
Sponsored in part by Water Resources Council, Washington, DC.

The St. Francis River basin drains 6,343 square miles in southern Quebec and northeastern Vermont, including Lake Memphremagog, an international lake with headwaters in Vermont and the outlet in Quebec. Although not subject to intense development pressures, the basin does experience water related problems with fluctuating lake levels (levels in Lake Memphremagog are now regulated under a 1935 international agreement), water pollution, and fisheries, particularly flow and passage problems on the Clyde River.

PB82-129305 PC **A14**/MF **A01**
Geological Survey, Baton Rouge, LA. Water Resources Div.
Water Resources Data for Louisiana, Water Year 1980. Volume 3: Coastal Louisiana.
Water-data rept. 1 Oct 79-30 Sep 80.
1980, 320p USGS/WRD/HD-80/027, USGS-WDR-LA-3
See also Volume 1, PB81-171621. Prepared in cooperation with Louisiana Dept. of Transportation and Development.

Water resources data for the 1980 water year for Louisiana consist of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels and water quality of ground water. This report, in three volumes, contains records for water discharge at 75 gaging stations (including stage for 71 of these stations); stage only for 38 gaging stations and 11 lakes; contents for 1 reservoir; water quality for 124 surface-water stations (including 34 gaging stations), 107 miscellaneous sites, and 15 lakes, and 268 wells; and water levels for 506 observation wells.

PB82-133448 PC **A02**/MF **A01**
Geological Survey, Tallahassee, FL. Water Resources Div.
Borehole Data-Collection Methods Applicable for the Regional Observation and Monitor Well Program, Southwest Florida Water Management District.
Water-resources investigations,
John J. Hickey. Sep 81, 16p USGS/WRD/WRI-81-093, USGS/WRI-81-57
Prepared in cooperation with Southwest Florida Water Management District, Brooksville.

Management of ground-water resources within the Southwest Florida Water Management District requires that hydrogeologic characteristics of water-bearing rocks and quality characteristics of water be described. Wells for the District's Regional Observation and Monitor Well Program are drilled specifically to collect data to describe the groundwater resource. Borehole data-collection methods for these wells include drilling in stages; running geophysical logs at the completion of each stage; collection of water-level and specific-conductance data before, during, and after a day's drilling; specific-capacity determinations after a day's drilling; and placing a packer in the gypsiferous and anhydritic limestone and dolomite for water-level and water-quality data.

PB82-134222 PC **A11**/MF **A01**
Fish and Wildlife Service, Fort Collins, CO. Cooperative Instream Flow Service Group.
User's Guide to the Physical Habitat Simulation System (PHABSIM).
Instream flow information paper,
Robert T. Milhous, David L. Wegner, and Terry J. Waddle. Sep 81, 237p IFIP-11, FWS/OBS-81/43

The manual contains instructions and guidelines for using the Physical Habitat Simulation System (PHABSIM) developed by the Instream Flow Group, U.S. Fish and Wildlife Service. The PHABSIM system simulates the physical habitat in relation to flow regime and physical structure of a stream and has been applied to water management and fisheries management. The manual contains specific descriptions of the theory and organization of the computer programs making up PHABSIM. Appendix material contains directions for use of particular programs or for specialized applications of the programs.

PB82-135930 PC **A19**/MF **A01**
Geological Survey, Indianapolis, IN. Water Resources Div.
Water Resources Data for Indiana, Water Year 1980.
Water-data rept. (Annual) 1 Oct 79-30 Sep 80.
Jun 81, 432p USGS/WRD/HD-80/059, USGS-WRD-IN-80-1
See also report for 1979, PB80-224223. Prepared in cooperation with the State of Indiana.

Water resources data for the 1980 water year for Indiana consists of records of stage, discharge, and water quality of streams; stage and contents of lakes and reservoirs; and water levels in wells. This report contains discharge records for 185 gaging stations; stage and contents for 12 lakes and reservoirs; releases from 6 flood-control reservoirs; water quality for 51 gaging stations; and water levels for 79 observation wells. Also included are 97 crest-stage partial-record stations and 69 low-flow partial-record stations.

PB82-136110 PC **A23**/MF **A01**
Geological Survey, Tallahassee, FL. Water Resources Div.
Water Resources Data for Florida, Water Year 1980. Volume 1: Northeast Florida.
Water-data rept. (Annual) 1 Oct 79-30 Sep 80.
Apr 80, 550p USGS/WRD/HD-80/043, USGS-WDR-FL-80-1
See also Volume 4 dated 1979, PB81-181042.

Water resources data for the 1980 water year for northeast Florida includes continuous or daily discharge for 55 streams, periodic discharge for 4 streams peak discharge for 32 streams, continuous or daily stage for 24 streams and periodic stage for 3 streams; continuous elevations for 23 lakes and periodic elevations for 28 lakes; continuous ground water levels for 29 wells, periodic ground water levels for 118 wells, and miscellaneous water level measurements for 855 wells; quality of water for 29 surface water sites and for 205 wells.

PB82-136128 PC **A99**/MF **A01**
Geological Survey, Tallahassee, FL. Water Resources Div.
Water Resources Data for Florida. Volume 4: Northwest Florida.
Water-data rept. (Annual) 1 Oct 79-30 Sep 80.
Aug 81, 714p USGS/WRD/HD-81/082, USGS-WDR-FL-80-4

The data for northwest Florida for 1980 includes continuous or daily discharge for 64 streams, periodic discharge for 18 streams, peak discharge for 36 streams, continuous or daily stage for 4 streams and periodic stage for 0 streams; continuous elevations for 4 lakes and periodic elevations for 18 lakes; continuous ground water levels for 40 wells, periodic ground water levels for 115 wells, and miscellaneous water level measurements for 295 wells; quality of water for 36 surface water sites and for 113 wells.

PB82-137696 PC **A03**/MF **A01**
Geological Survey, Helena, MT. Water Resources Div.
Mean Annual Streamflow of Selected Drainage Basins in the Coal Area of Southeastern Montana.
Water-resources investigations (Final),
Rodger F. Ferreira. Oct 81, 28p USGS/WRD/WRI-81-097, USGS/WRI-81-61
Prepared in cooperation with Bureau of Land Management, Washington, DC., and Environmental Protection Agency, Washington, DC.

Streamflow characteristics of drainage basins within the Fort Union coal region of southeastern Montana were estimated to provide premining data for evaluating the future effects of mining on the environment. Estimated annual mean streamflow at 22 data-collection stations for water years 1975-77 ranged from 0 to 887 cubic feet per second. These estimates are based on miscellaneous-streamflow records at each station and continuous-streamflow records from other stations in the study area. Estimated mean annual streamflow for a 10-year period (water years 1968-77) ranged from 0 to 572 cubic feet per second. Many of the drainage basins had a mean annual runoff of less than 0.60 inch; the maximum observed mean annual runoff was 4.45 inches.

PB82-138751 PC **A04**/MF **A01**
Geological Survey, Lawrence, KS. Water Resources Div.
Selected Hydrologic Relationships for Soldier Creek, Northeastern Kansas.
Water-resources investigations (Final),
William J. Carswell, Jr. Apr 81, 69p USGS/WRD/WRI-81-099, USGS/WRI-81-8

Prepared in cooperation with Kansas Water Resources Board, Topeka.

Hydrologic data from Soldier Creek basin were compared with relations from statewide data. The quantity and quality of streamflow were affected mostly by soils, slopes, and land use. Average annual precipitation during the study (1964-76) was 35.12 inches, or 2.3 percent greater than the long-term (1929-76) average. The average streamflow in Soldier Creek at Topeka, Kansas, was 23 percent greater than the long-term average. In general, frequency curves of annual peak discharges compared poorly with curves from statewide relations due to the absence of extremely low peaks during the short period.

PB82-139387 PC **A02**/MF **A01**
Bureau of Reclamation, Denver, CO. Engineering and Research Center.
Colorado River Simulation System: An Executive Summary.
Michael S. Cowan, R. Wayne Cheney, and Jeffrey C. Addiego. 1981, 19p

The CRSS (Colorado River Simulation System) is a deterministic digital computerized simulation model that has been developed by the Bureau of Reclamation in accordance with all the 'Laws of the River.' With CRSS, proposed changes to the operation or alternative development schemes of the river system can be modeled and their effect on the future quantity and quality of water in the river may be evaluated.

PB82-802745 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Remote Sensing Applied to Hydrology. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 252p
Supersedes PB80-813132, and NTIS/PS-79/0845.

The use of aerial and satellite imagery in hydrologic studies, including water resources planning and management, is discussed. The abstracts cover remote sensing studies of water quality, soil moisture, floodplain delineation, ice cover, and determination of snow depth and water equivalent. (This updated bibliography contains 245 citations, 20 of which are new entries to the previous edition.)

8I. Mining Engineering

AD-A107 185/1 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Comments on Interior's Surface Mining Regulations.
5 Aug 81, 18p Rept no. GAO/CED-81-145

The General Accounting Office has been reviewing the Office of Surface Mining Reclamation and Enforcement (OSM), Department of the Interior, regulations implementing the Surface Mining Control and Reclamation Act of 1977 (Public Law 95-87). We initiated this review to follow-up on our September 21, 1979, report entitled 'Issues Surrounding the Surface Mining Control and Reclamation Act' (CED-79-83) and because of congressional, State, industry, and public interest and controversy in controlling and reclaiming coal surface mined areas. OSM is in the process of making major revisions to its regulations and we, therefore, do not plan further work at this time. However, during our regulatory analysis of seven regulations and discussions with various officials, we identified issues which we are suggesting OSM consider while revising its regulations. Our objective was to determine if key regulations provided adequate environmental protection while allowing States and coal mine operators sufficient flexibility to choose the appropriate methods necessary to achieve the Act's environmental goals at the least cost. Our review consisted of interviewing officials of four State natural resource agencies (Colorado, Pennsylvania, West Virginia, and Wyoming), four coal associations, two coal companies, two environmental groups, one bonding association, the National Academy of Sciences, the Environmental Protection Agency, the Bureau of Mines, and OSM.

DE81023998 PC **A07**/MF **A01**
Washington State Government, Olympia.
Proceedings of the Geothermal Symposium: Potential, Legal Issues, Economics, Financing.
R. G. Bloomquist. 2 Jun 80, 134p WAOENG-80-16, CONF-8006173-
Contract FG51-79R000079
Geothermal symposium: potential, legal issues, economics, financing, Seattle, WA, USA, 2 Jun 1980.

Fourteen papers are included. A separate abstract was prepared for each one. (ERA citation 06:034651)

DE81030377 PC **A04**/MF **A01**
Science Applications, Inc., Morgantown, WV.
Integration, Interpretation and Evaluation of Results in a Multi-Well Interference Test Project. Quarterly Financial Summary and Monthly Technical Report.
J. Alam. 8 Sep 81, 64p DOE/MC/16823-T1
Contract AC21-78MC16823

The objectives of this project are to analyze interference test data in order to determine in situ flow properties of Devonian shale reservoirs. Preliminary analysis of build-up interference test data and drawdown test data for all the zones is summarized. The drawdown interference data have been analyzed in order to identify the matrix influence and quantify its properties which are then used in quantifying key parameters. Preliminary analysis of the interference test data indicates pseudo-steady state (quasi-steady-state) gas transport in the matrix. The approximate fracture storage coefficient and dimensionless fracture transfer coefficient from the bottom zone of well number 10056B were calculated as 10 exp -1 to about 10 exp -2 , and 4.0 x 10 exp -8 , respectively. (ERA citation 06:034301)

DE81030839 PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Effect of Thermomechanical Properties on Initial Cavity Growth.
R. E. Glass. 1981, 21p SAND-81-1941C, CONF-810923-9
Contract AC04-76DP00789
Underground coal conversion symposium, Fallen Leaf Lake, CA, USA, 8 Sep 1981.

Recent field and laboratory studies in UCG have indicated that the thermomechanical properties of coals may be the controlling parameters in determining initial cavity growth. To examine this possibility laboratory and modeling efforts are being directed at determining these properties and incorporating them in a cavity growth model. The results of the work emphasize the critical role that anisotropic strengths play in determining the shape of the cavity. (ERA citation 06:034221)

DE81030967 PC **A02**/MF **A01**
United Coal Co., Bristol, VA.
Project to Develop and Demonstrate Methods to Eliminate Frozen-Coal-Handling Problems. Status Report IV.
Sep 81, 18p DOE/PC/30076-T3
Contract AC22-80PC30076

A description is presented of an investigation leading to solutions to the frozen coal problems occurring during winter months. Tests will be carried out in a test facility to evaluate those engineering parameters essential to the design, development, and demonstration of the most effective, economical, and environmentally acceptable method for fracturing frozen coal. The tests carried out during the initial feasibility study will provide the data and optimal procedures necessary for the implementation of a field test program to verify the acceptability and to demonstrate the commercial feasibility of the most effective methods or systems. The costs and benefits that will accrue from the new technology will be determined. To accomplish the goal of finding acceptable solutions to frozen coal problems, it will be necessary to bring forth the best possible technology available to get the job done. In pursuit of this objective, United Coal Company has initiated a comprehensive survey and search to gather all known data and information relative to the subject of frozen coal, as well as methods - both mechanical and chemical - that have been employed to date in attacking the problem. (ERA citation 06:034264)

DE81031974 PC **A05**/MF **A01**
Battelle Columbus Labs., OH.
Extensible Bridge-Conveyor Concepts for Coal-Mine Face Haulage. Final Technical Report as of 21 April 1981.
J. C. Swain, D. L. Thomas, and E. C. Mullen. 1981, 87p DOE/ET/14210-T1
Contract AC01-79ET14210

The objective of the work reported herein was to develop design concepts for extensible bridge conveyors which can be used in multiples to form a continuous haulage system. Consultation services were provided by Jeffrey Mining Machinery Division on mining technology and B.F. Goodrich Engineered Systems Division on conveyor belt technology. Additional information was gathered in a mine visit, during visits to conveyor manufacturers, and contacts with several component suppliers. From a group of 20 machinery arrangement concepts, three extensible conveyor approaches were selected and machinery arrangement and internal detail drawings were prepared for each. Two of the concepts are for a face haulage system in which separate nonconnected extensible conveyors are individually trammed into position to form a continuous haulage system. The third concept is for a connected extensible system similar to existing continuous face haulage systems but employing extensible rather than fixed-length bridges. Cost estimates were prepared for the three concepts. The concepts developed employ belt-type conveyors, however, chain-type conveyors were considered to be a viable alternative. (ERA citation 06:034258)

DE82000338 PC **E06**/MF **A01**
Western Geophysical Co. of America, Houston, TX. Aero Service Div.
Airborne gamma-Ray Spectrometer and Magnetometer Survey: Harrison Bay Quadrangle, Alaska. Final Report, Volume 1.
Feb 81, 130p GJBX-299-81
Contract AC13-76GJ01664
Includes 6 sheets of 48x reduction microfiche.

During the months of July and August of 1980, Aero Service Division Western Geophysical Company of America conducted an airborne high sensitivity gamma-ray spectrometer and magnetometer survey over eleven (11) 3 exp 0 x 1 exp 0 and one (1) 4 exp 0 x 1 exp 0 NTMS quadrangles of the Alaska North Slope. These include the Barrow, Wainwright, Meade River, Teshekpuk, Harrison Bay, Beechey Point, Point Lay, Utukok River, Lookout Ridge, Ikpikpuk River, Umiat, and Sagavanirktok quadrangles. This report discusses the results obtained over the Harrison Bay map area. (ERA citation 06:034327)

DE82000347 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Effects of Gas-Flow Pattern on Cavity Shape.
J. R. Creighton. 22 Jul 81, 16p UCRL-85907, CONF-810923-10
Contract W-7405-ENG-48
Underground coal conversion symposium, Fallen Leaf Lake, CA, USA, 8 Sep 1981.

The effects of different gas flow patterns on the cavity shape in laboratory scale coal block experiments are shown. For simplicity, the burning of pure carbon, rather than coal is modeled. The rate of removal of carbon from the cavity wall is shown to depend on the local rate of oxygen transport to the wall. A numerical model which assumes plug flow in the cavity with a laminar boundary layer gives cavities shaped like an exponential horn, with the largest radius next to the inlet. The downstream shape is in reasonable agreement with experiment but the upstream shape differs. When the flow in the cavity is calculated using the full Navier-Stokes equations the flow near the inlet resembles an expanding jet surrounded by a torroidal vortex. The maximum rate of oxygen transport to the wall occurs where the jet strikes the converging cavity wall some distance downstream. The reduced oxygen transport near the inlet causes the upstream portion of the cavity to be rounded, in agreement with experiment. The downstream portion of the cavity is similar to that with plug flow. (ERA citation 06:034223)

DE82000482 PC **A08**/MF **A01**
Utah Univ., Salt Lake City. Coll. of Mines and Mineral Industries.
Investigation of Factors Affecting the in-Situ Combustion Retorting of Oil Shale. Final Report.
H. Y. Sohn. 29 May 81, 166p DOE/ET/13095-T1
Contract AS03-78ET13095

The objective of this research was to carry out an experimental and analytical investigation of a number of subprocesses taking place during an in situ combustion retorting of oil shale. Some of these subprocesses also occur in a surface retorting process. The specific

topics of this research program include: (1) experimental determination of the intrinsic kinetics of kerogen decomposition producing oil; (2) mathematical formulation of the retorting of an oil shale block in the presence of heat transfer effects; (3) experimental determination of the intrinsic kinetics of oil shale char oxidation; (4) mathematical modeling of the oxidaton of oil shale char in a spent shale block in the presence of heat and mass transfer effects; (5) determination of ignition delay and energy requirements for the ignition of an oil shale bed; (6) determination of thermal expansion of oil shale; and (7) determination of heat capacities of oil shale and the heat of decomposition of kerogen. The results of the investigation of these topics are presented. Some of the results have been published in journals which are readily available. In such a case only a brief summary of the results are presented. (ERA citation 06:034309)

DE82000709 PC **A04**/MF **A01**
CER Corp., Las Vegas, NV.
Western Gas Sands Project. Interim Economic Analysis of Natural Gas Production from Tight Formations in Selected Western Basins.
Jul 81, 64p DOE/BC/10003-23
Contract AC08-79BC10003

The following are reported: economic analysis methodology, Wattenberg (Colorado) field data assessment, Washakie (Wyoming) Basin data assessment, and estimation of well performance using multiple regression analysis. (ERA citation 06:034305)

DOE/ET/27232-T4 PC **A08**/MF **A01**
WESTEC Services, Inc., San Diego, CA.
Utilization of Geothermal Energy in the Mining and Processing of Tungsten Ore. 2ND Quarterly Report.
M. V. Erickson, C. A. Willens, K. M. Walter, R. L. Carrico, and G. D. Lowe. Jun 80, 174p
Contract AC03-79ET27232

The completed geochemical analysis of groundwater in the Pine Creek area for evaluation of the geothermal potential of this location is presented. Also included is an environmental constraints analysis of Pine Creek noting any potential environmental problems if a geothermal system was developed onsite. Design of a geothermal system is discussed for site-specific applications and is discussed in detail with equipment recommendations and material specifications. A preliminary financial, economic, and institutional assessment of geothermal system located totally on Union Carbide property at Pine Creek is included. (ERA citation 05:032150)

DOE/ET/28384-T1 PC **A06**/MF **A01**
University of Southern California, Los Angeles. Dept. of Petroleum Engineering.
Formation Evaluation in Liquid-Dominated Geothermal Reservoirs.
I. Ershaghi, E. E. Dougherty, and L. L. Handy. Apr 81, 106p
Contract AT03-76ET28384

Studies relative to some formation evaluation aspects of geothermal reservoirs are reported. The particular reservoirs considered were the liquid dominated type with a lithology of the sedimentary nature. Specific problems of interest included the resistivity behavior of brines and rocks at elevated temperatures and studies on the feasibility of using the well log resistivity data to obtain estimates of reservoir permeability. Several papers summarizing the results of these studies were presented at various technical meetings for rapid dissemination of the results to potential users. These papers together with a summary of data most recently generated are included. A brief review of the research findings precedes the technical papers. Separate abstracts were prepared for four papers. Five papers were abstracted previously for EDB. (ERA citation 06:034642)

DOE/ET/28476-T2 PC **A06**/MF **A01**
Oregon Inst. of Tech., Klamath Falls. Geo-Heat Utilization Center.
Alaska: A Guide to Geothermal Energy Development.
N. Basescu, R. G. Bloomquist, C. Higbee, D. Justus, and S. Simpson. Jun 80, 125p
Contract AS06-77ET28476

A brief overview is given of the geological characteristics of each region of the state as they relate to potential geothermal development. Those exploration methods which can lead to the siting of a deep exploration well are described. Requirements and techniques needed for drilling deeper higher temperature exploration and production wells are presented. Electrical generation, direct utilization, and indirect utilization are reviewed. Economic factors of direct use projects are presented. A general guide to the regulatory framework affecting geothermal energy development is provided. The general steps necessary to gain access to explore, develop, distribute, and use geothermal resources are outlined. (ERA citation 05:032066)

GJBX-108(78)(V.1)(TYEK) PC **A06**/MF **A01**
LKB Resources, Inc., Huntingdon Valley, PA.
NURE Aerial gamma-Ray and Magnetic Reconnaissance Survey. Cook Inlet Alaska Area: Tyonek Quadrangle.
Jul 78, 110p
Contract EY-76-C-13-1664

Volume II contains the following information for Tyonek, Alaska: geologic base map, flight path map, anomaly maps (U, Th, K, U/Th, U/K, Th, K), radiometric multi-parameter stacked profiles, magnetic and ancillary stacked profile data, and statistical data. (ERA citation 04:025546)

GJBX-108(78)(V.2)(ANGE) PC **A05**/MF **A01**
LKB Resources, Inc., Huntingdon Valley, PA.
NURE Aerial gamma-Ray and Magnetic Reconnaissance Survey. Cook Inlet Alaska Area: Anchorage Quadrangle.
Jul 78, 98p
Contract EY-76-C-13-1664

Volume II contains the following information for Anchorage, Alaska: geologic base map, flight path map, anomaly maps (U, Th, K, U/Th, U/K, Th/K), radiometric multi-parameter stacked profiles, magnetic and ancillary stacked profile data, and statistical data. (ERA citation 04:025547)

GJBX-136(80) PC **A08**/MF **A01**
Texas Instruments, Inc., Dallas. Airborne Geophysical Services.
Near-Surface Moisture and Biomass Influences on the Reliability of Aerial Radiometric Surveys as a Measure of Natural Radioelement Concentrations.
J. R. Norwine, D. J. Hansen, D. F. Saunders, and J. H. Galbraith. 28 Sep 79, 151p
Contract AC13-76GJ01664

Significant differences in aerial radiometric system calibration constants in humid-forested (Portland quadrangle) and desert (Lake Mead test strip) regions indicated the probability of substantial gamma-ray absorption by soil moisture in humid areas. A set of test quadrangles was selected to investigate relationships among a group of environmental variables and ratios of whole-quadrangle mean (X) stream sediment uranium (U) and thorium (Th) contents to corresponding mean aerial radiometric uranium and thorium measurements. It was assumed that stream sediment values might be sufficiently representative of the average surface radioelement concentrations to be used in ground-calibrating the aerial systems. Preliminary testing established strong statistical correlations between the radioelement ratios and moisture and biomass variables. However, it is recognized that moisture and biomass relationships represent a variety of variables affecting the aerial gamma-ray measurements, such as soil formation, including weathering effects. Also, the data suggested that in certain very humid areas placering effects caused the mean thorium and uranium content of stream sediments to be much greater than actual concentrations in the average surface rocks. These effects appeared to be minimal in the arid regions, where the stream sediment data were more representative of the surface materials in general. These observations prompted a follow-up study using surface-to-aerial ratios based on analyses of surface samples in humid regions and including the stream sediment-to-aerial data ratios only for the relatively arid areas. Multiple linear regression analyses of the data indicated two-variable models would provide reasonable correction factors for aerial data obtained in humid environments. (ERA citation 05:030232)

GJBX-149(80) PC **E06**/MF **A01**
EG and G GeoMetrics, Sunnyvale, CA.
Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Springfield Quadrangle of Missouri. Final Report.
Jun 80, 234p
Contract AC13-76GJ01664

The Springfield quadrangle of southern Missouri contains a portion of the Ozark Uplift. Near-surface Precambrian rocks are almost completely covered in this area by a thin veneer of Paleozoic carbonates. The region has undergone recent uplifting. Several faults cut through the Paleozoic section but show no extreme displacement. Examination of available literature shows no known uranium deposits (or occurrences) within the quadrangle. Fifty-six groups of uranium samples were defined as anomalies and discussed briefly. None were considered significant, and most appeared to be of cultural origin. Magnetic data were influenced largely by the underlying Precambrian. The structure and lithology of the Precambrian is apparently complex, and suggests that some surface faults may extend into the basement material. (ERA citation 05:031635)

GJBX-150(80) PC **E07**/MF **A01**
EG and G GeoMetrics, Sunnyvale, CA.
Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Harrison Quadrangle, Missouri and Arkansas. Final Report.
Jun 80, 262p
Contract AC13-76GJ01664

The Harrision quadrangle of southern Missouri and northern Arkansas lies intermediate between the Ozark Plateau and the Boston Mountains, on the southern limb of the Ozark Uplift. Near-surface Precambrian rocks are almost completely covered in this area by a thin veneer of Paleozoic carbonates. The region has undergone recent uplifting. Several faults cut through the Paleozoic section but show no extreme displacement. Examination of available literature shows no known uranium deposits (or occurrences) within the quadrangle. Sixty-six groups of uranium samples were defined as anomalies and are discussed briefly. None were considered significant and most appeared to be of cultural origin. Magnetic data were influenced largely by the underlying Precambrian. The structure and lithology of the Precambrian is apparently complex, and suggests that some surface faults may extend into the basement material. (ERA citation 05:031636)

GJBX-151(80) PC **E07**/MF **A01**
EG and G GeoMetrics, Sunnyvale, CA.
Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Shreveport Quadrangle of Louisiana. Final Report.
Jul 80, 267p
Contract AC13-76GJ01664

The Shreveport quadrangle of northwestern Louisiana lies intermediate between the axes of the Sabine and Monroe Uplifts in the Gulf Coastal Physiographic Province. Tertiary and Quaternary sediments dominate the exposed sequence, but the region contains a substantial thickness of Mesozoic rocks as well. Examination of available literature shows no known uranium deposits in the quadrangle. Fifty-four groups of uranium samples were defined as anomalies and discussed briefly. None were considered significant, and most appeared to be of cultural origin. Magnetic data appeared to define the shallower portions of the Sabine Uplift quite well. Other structures in the area were not as well defined by the magnetics. (ERA citation 05:031637)

GJBX-152(80) PC **E08**/MF **A01**
EG and G GeoMetrics, Sunnyvale, CA.
Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Alexandria Quadrangle of Louisiana and Texas. Final Report.
Jul 80, 303p
Contract AC13-76GJ01664

The Alexandria quadrangle lies on the border between Texas and Louisiana in the northern Gulf Coastal Physiographic Providence. The area overlies portions of the Sabine Uplift in the northwest, but sediments are both Quaternary and Tertiary in age and represent both marine and nonmarine depositional environments. A search of available literature revealed no known uranium anomalies. Sixty-nine uranium anomalies were detected and are discussed briefly. Only those anomalies in the high thorium area were considered significant. Most of the rest of the anomalies ap-

peared to be of cultural origin. Magnetic data appeared to be in agreement with existing structural interpretations of the region. (ERA citation 05:031638)

GJBX-153(80) PC **E07**/MF **A01**
EG and G GeoMetrics, Sunnyvale, CA.
Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Jackson Quadrangle of Mississippi and Louisiana. Final Report.
Jul 80, 260p
Contract AC13-76GJ01664

The Jackson quadrangle covers a region largely within the Mississippi River flood plain. In the extreme northern Gulf Coastal Physiographic Province. Underlying Mesozoic and Cenozoic sediments of the Mississippi Embayment are relatively thick. Exposed sediments are largely Quaternary in age, though older Cenozoic material of both marine and nonmarine origin are exposed in areas adjacent to the flood plain in the east. A search of the available literature revealed no known uranium deposits. Seventy-three uranium anomalies were detected and are discussed briefly. None were considered significant, and most appeared to be of cultural origin. Magnetic data appears to be in agreement with existing structural interpretations of the region. (ERA citation 05:031639)

GJBX-154(80) PC **E08**/MF **A01**
EG and G GeoMetrics, Sunnyvale, CA.
Aerial gamma Ray Amd Magnetic Survey: Mississippi and Florida Survey, Meridian Quadrangle of Mississippi and Alabama. Final Report.
Jul 80, 323p
Contract AC13-76GJ01664

The Meridian quadrangle of Alabama and Mississippi lies on the northeastern edge of the Gulf Coastal Physiographic Province. The structure of the area is complex, with thick wedge of Mesozoic and Cenozoic sediments covering the northwesterly-trending Ouachita Tectonic Zone, and the northeasterly-trending Appalachian Front. Cretaceous rocks are exposed in the northeast, whereas the balance of the quadrangle contains exposures of Tertiary and Quaternary sediments. Examination of available literature shows no known uranium deposits in the quadrangle. One hundred groups of uranium samples were defined as anomalies and discussed briefly in this report. One group of anomalies in Cretaceous rocks was considered as being possibily significant. Most of the remaining anomalies appeared to be of cultural origin. Magnetic data suggests deep-seated magnetic sources, and at the map scale, are not realistically correlatable with known sedimentary structures. (ERA citation 05:031640)

GJBX-155(80) PC **E07**/MF **A01**
EG and G GeoMetrics, Sunnyvale, CA.
Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Hattiesburg Quadrangle of Mississippi, Alabama, and Louisiana. Final Report.
Jul 80, 279p
Contract AC13-76GJ01664

The Hattiesburg quadrangle of Mississippi, Alabama, and Louisiana lies in the northern Gulf coastal Physiographic Province. The region overlies a portion of the intersection the Ouachita Tectonic Belt and the Appalachian Front, but is covered with a substantial thickness of sediments post dating the orogenic periods. Several faults and a minor flexure zone cut across the northeastern quadrant. Examination of available literature shows no known uranium deposit within the quadrangle. Seventy-four groups of uranium samples were defined as anomalies and are discussed briefly. None were considered significant, and most appeared to be of cultural origin. Magnetic data showed extremely low gradients, and suggest deep-seated magnetic sources. Relatively higher gradients in the fault/flexure zone suggest slightly shallower sources in this area. (ERA citation 05:031641)

GJBX-23(79)(V.2-A) PC **A15**/MF **A01**
Texas Instruments, Inc., Dallas.
Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Arizona--New Mexico, Mesa Quadrangle.
Nov 78, 333p
Contract EY-76-C-13-1664

The results of a high-sensitivity aerial gamma-ray spectrometer and magnetometer survey of the Mesa Quadrangle, Arizona, are presented. Statistical and geological analysis of the radiometric data revealed 110 uranium anomalies worthy of field checking as possible prospects. Sixty-three anomalies suggest the presence of vein-type uranium in acid igneous rocks of Tertiary to Mesozoic age. Twenty-three anomalies are related to Precambrian granites and three to Precambrian schists. The Dripping Spring Quartzite, which has the greatest possibility for mineralization in the Mesa Quadrangle, is associated with 16 anomalies. Six anomalies may indicate uranium mineralization in the potentially favorable Supai Formation in the northeastern part of the quadrangle. The presence of possible stratiform uranium deposits in basins is indicated by 35 anomalies in rocks varying in age from Quaternary to Cretaceous. Ranges appearing most favorable for uranium mineralization include Humbolt Mountain, West Granite-Herder Mountains area, Pine Mountain--Four Peaks area, Fish Creek--Iron Mountains area, Dripping Spring--Tortilla-Mescal Mountains zone, west side of Gila Mountains, Sierra Ancha, and east of the Sierra Ancha. (ERA citation 04:029332)

GJBX-23(79)(V.2-B) PC **A15**/MF **A01**
Texas Instruments, Inc., Dallas.
Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Arizona--New Mexico, Clifton Quadrangle.
Nov 78, 334p
Contract EY-76-C-13-1664

The results of a high-sensitivity, aerial, gamma-ray spectrometer and magnetometer survey of the Clifton Quadrangle, Arizona and New Mexico, are presented. Statistical and geological analysis of the radiometric data revealed 146 uranium anomalies worthy of field checking as possible prospects. Seventy-four anomalies suggest the presence of vein-type uranium in acid igneous rocks of Quaternary to Cretaceous age. Four anomalies may indicate mineralization in the potentially favorable Supai Formation, and two are located in Cretaceous sedimentary rocks. The presence of possible stratiform uranium deposits in basins is indicated by 61 anomalies in Quaternary and/or Tertiary sedimentary rocks. The regions appearing most favorable for uranium mineralization include the Odart Mountain-Baldy Peak Area, North Fork White River Area, the flanks of the Gila Mountains, the San Francisco Mountains, the northern part of the Tularosa Mountains, the Mogollon Mountains, the Baldy Mountain-Maverick Hill Area, northeast of Baldy Mountain, and northwest of Black Mountain. (ERA citation 04:029333)

GJBX-23(79)(V.2-C) PC **A19**/MF **A01**
Texas Instruments, Inc., Dallas.
Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Arizona--New Mexico, Tucson Quadrangle.
Nov 78, 448p
Contract EY-76-C-13-1664

The results of a high-sensitivity aerial gamma-ray spectrometer and magnetometer survey of the Tucson Quadrangle, Arizona, are presented. Statistical and geological analysis of the radiometric data revealed 72 uranium anomalies worthy of field checking as possible prospects. Forty-five preferred anomalies suggest the presence of vein-type uranium in acid intrusives and volcanics. These anomalies also mark source areas for possible sedimentary deposits in basins along the flanks of ranges. Nineteen anomalies over Quaternary sand deposits may represent sedimentary uranium, but many of these may be anomalous clastics deposited in low-background material. The ranges most favorable for uranium mineralization include (1) Silver Reef-Sawtooth-Slate Mountains, (2) Vaca-Silnakya-South Comobabi Mountains, (3) Silver Bell-Waterman-Roskruge-Coyote Mountains, (4) Tanque Verde-Rincon Mountains, (5) Galiuro-Winchester Mountains, and (6) Santa Teresa-Pinaleno Mountains. (ERA citation 04:029334)

GJBX-35(80)(V.2) PC **A09**/MF **A01**
LKB Resources, Inc., Huntingdon Valley, PA.
Nure Aerial gamma-Ray and Magnetic Reconnaissance Survey: Colorado-Arizona Area, Grand Canyon NJ 12-10 Quadrangle.
Dec 79, 194p
Contract EY-76-C-13-1664

Volume II contains the following data from the aerial gamma-ray and magnetic reconnaissance survey of the Grand Canyon NJ 12-10 quadrangle of the Colorado-Arizona area: geologic base map; flight path map; anomaly maps (U, Th, K, U/Th, U/K, Th/K); radiometric multiple-parameter stacked profiles; magnetic and ancillary stacked profile data; and histograms. (ERA citation 05:014897)

GJBX-37(79)(V.1) PC **E13**/MF **A01**
INCO, Inc., McLean, VA.
Aeria! Radiometric and Magnetic Survey: Seguin National Topographic Map, Texas Gulf Coast.
139p
Contract EY-76-C-13-1664

The results from an airborne gamma ray and total magnetic field survey of the Sequin quadrangle in Texas are presented. The Seguin Sheet shows the surficial geology for an area between latitudes 29 exp 0 00' and 30 exp 0 00' N and longitudes 96 exp 0 00' and 98 exp 0 00' W. Late Mesozoic, Tertiary, and Quaternary aged sediments are part of the coastal plain of the Gulf Coast Geosyncline. The Cenozoic strata crop out in subparallel belts which are progressively younger seaward. The Quaternary deposits are concentrated, mainly, in the southeastern part of the area, or form a dendritic pattern along the streams and tributaries of the Colorado and Guadalupe river systems. The Pleistocene Beaumont, Leona, and Willis formations are extensive, and cover approximately 30% of the map sheet area. Important deposits of uranium have been located in the Deweesville Sandstone Member of the Whitsett Formation. This Eocene sandstone occurs in the southwestern section of the area. (ERA citation 04:032468)

GJBX-37(79)(V.2) PC **A08**/MF **A01**
INCO, Inc., McLean, VA.
Aerial Radiometric and Magnetic Survey: Seguin National Topographic Map, Texas Gulf Coast.
168p
Contract EY-76-C-13-1664

Flight line profile data and statistical analysis results are presented for the Texas Gulf Coast. (ERA citation 04:032469)

GJBX-40(79)(V.2-A) PC **A14**/MF **A01**
Texas Instruments, Inc., Dallas.
Study of Airborne gamma-Ray Spectrometer Data Procedures: Wind River Basin, Wyoming, Casper Quadrangle.
Jan 79, 319p
Contract EY-76-C-13-1664

The following data are presented: statistical summary tables (Wind River Basin and Casper Quadrangle); flight-line averages; geologic map units; geologic map with record locations; uranium mines and occurrences; uranium location map; symbol anomaly maps (eU, eU/eTH, eU/K, eTh, K, eTh/K) numerical anomaly maps (eU, eU/eTh, eU/K, eTh, K, eTh/K); profile anomaly maps (eU, eU/eTh, eU/K, eTh, K, eTh/K); preferred anomaly maps (4-, 7-, 8-, and 9-point); combined 4- and 7-point preferred anomaly map; stacked significance factor profiles; and six-parameter histograms by geologic unit. (ERA citation 04:029346)

GJBX-40(79)(V.2-B) PC **A05**/MF **A01**
Texas Instruments, Inc., Dallas.
Study of Airborne gamma-Ray Spectrometer Data Procedures: Wind River Basin, Wyoming, Arminto Quadrangle.
Jan 79, 98p
Contract EY-76-C-13-1664

This volume contains the following data for the Arminto Quadrangle, Wind River Basin, Wyoming: statistical summary tables; flight-line averages; geologic map units; geologic map with record locations; uranium mines and occurrences, uranium location map, eU symbol anomaly map; eU/eTh symbol anomaly map; eU/K symbol anomaly map; eTh symbol anomaly map; K symbol anomaly map; eTh/K symbol anomaly map; eU profile anomaly map; eU/eTh profile anomaly map; eU/K profile anomaly map; eTh profile anomaly map; K profile anomaly map; eTh/K profile anomaly map; preferred anomaly maps (4- and 7-point); combined 4- and 7-point preferred anomaly map; and stacked significance factor profiles. (ERA citation 04:029347)

GJBX-40(79)(V.2-D) PC **A06**/MF **A01**
Texas Instruments, Inc., Dallas.
Study of Airborne gamma-Ray Spectrometer Data Procedures: Wind River Basin, Wyoming, Thermopolis Quadrangle.
Jan 79, 101p

Contract EY-76-C-13-1664

This volume contains the following data from the Thermopolis Quadrangle, Wind River Basin, Wyoming: statistical summary tables; flight-line averages; geologic map units; geologic map with record locations; uranium mines and occurrences, uranium location map; eU symbol anomaly map; eU/eTh symbol anomaly map; eU/K symbol anomaly map; eTh symbol anomaly map; K symbol anomaly map; eU profile anomaly map; eU/eTh profile anomaly map; eU/K profile anomaly map; eTh profile anomaly map; K profile anomaly map; eTh/K profile anomaly map; preferred anomaly maps (4- and 7-point), combined 4- and 7-point preferred anomaly map; and stacked significance factor profiles. (ERA citation 04:029349)

GJBX-59(80)(V.2) PC **E13**/MF**$6.00**
Texas Instruments, Inc., Dallas.
Aerial Radiometric and Magnetic Reconnaissance Survey of South-Central Colorado Trinidad Quadrangle.
Jan 80, 592p
Contract EY-76-C-13-1664

The results of a high-sensitivity, aerial, gamma-ray spectrometer and magnetometer survey of the Trinidad Quadrangle, Colorado, are presented. Instrumentation and methods are described in Volume 1 of this final report. Statistical and geological analysis of radiometric data revealed 51 uranium anomalies worthy of field-checking as possible prospects. (ERA citation 05:018420)

GJBX-71(80)(V.2)(OGDEN) PC **A18**/MF **A01**
EG and G GeoMetrics, Sunnyvale, CA.
Aerial gamma Ray and Magnetic Survey: Idaho Project, Ogden Quadrangle, Utah and Wyoming. Final Report.
Dec 79, 414p
Contract EY-76-C-13-1664

The Ogden quadrangle in northeastern Utah and southe western Wyoming contains portions of the Green River Basin, the Wasatch-Teton Line, and the Sevier overthrust belt. A small percentage of the quadrangle along the western edge lies within the Basin-Range Province. Tertiary nonmarine sediments dominate the surface of the quadrangle, grading into tightly folded Mesozoic and Paleozoic sediments and Precambrian crystalline rock in the uplifted regions of the west. Laramide thrust faults and younger normal faults have contributed significantly to the present set of exposures and the topography of the area. Magnetic data apparently show dominantly deep sources except in the Wasatch-Bear River Mountain chains where crystalline basement is partially exposed. The Ogden quadrangle has been unproductive in terms of uranium mining. No claims were found by examination of known literature sources. A total of 255 anomalies are valid according to the criteria set forth in Volume I. The anomalies are scattered throughout the quadrangle. One well-defined group has peak concentrations in the range of 10.0 ppm eU or greater. Some anomalies in this group show obvious signs of recent surveying and/or development on flight recovery film. (ERA citation 05:020111)

GJBX-71(80)(V.2)(SL) PC **A19**/MF **A01**
EG and G GeoMetrics, Sunnyvale, CA.
Aerial gamma Ray and Magnetic Survey: Idaho Project, Salt Lake City Quadrangle of Utah. Final Report.
Mar 80, 426p
Contract EY-76-C-13-1664

The Salt Lake City quadrangle in northeastern Utah contains portions of the Uinta Uplift, Uinta and Green River Basins, the Sevier Overthrust Belt, and the Basin-Range Province. Tertiary sediments dominate in the basins, Quaternary surface deposits and Precambrian sedimentary rocks are prevalent in the Uinta Uplift. Portions of the Uinta Uplift, and most of the Wasatch Mountains contain exposures of a tightly folded sequence of Mesozoic and Paleozoic Rocks. Laramide thrust faults and younger normal faults have contributed significantly to the recent topography of the area. Magnetic data apparently show dominantly deep sources, except in the Wasatch/Western Uinta area, where Tertiary intrusive bodies are exposed. The Salt Lake City quadrangle has apparently been relatively unproductive in terms of uranium mining. No claims were found by examination of known literature sources. A total of 199 anomalies are valid according to the criteria set forth in Volume I. The anomalies are scattered throughout the quadrangle. Other than a single anomaly of 46.8 ppM eU over an old AEC dump, none have peak count rates over 7.1 ppM eU. (ERA citation 05:020112)

GJBX-72(80)(V.1) PC **E04**/MF **A01**
Western Geophysical Co. of America, Houston, TX. Aero Service Div.
Airborne gamma-Ray Spectrometer and Magnetometer Survey: Norton Bay Quadrangle (Alaska). Final Report.
Jan 80, 104p
Contract EY-76-C-13-1664

During the months of July, August, and September 1979, an airborne high sensitivity gamma-ray spectrometer and magnetometer survey was conducted over ten 3 exp 0 x 1 exp 0 NTMS quadrangles of West-Central Alaska. The results obtained over the Norton Bay Map area are discussed. The final data are presented in four different forms: on magnetic tape; on microfiche; in graphic form as profiles and histograms; and in map form as anomaly maps and flight path maps. The histograms and the multiparameter are presented with the anomaly maps and flight path map in a separate volume. A total of twenty (20) uranium anomalies have been indicated on the interpretation map. No thorium anomalies were found. The uranium anomalies are all weak and generally have only U/K or U/T expression. Often the uranium concentration within the zone is low, and generally is less than 2.5 ppM. Only zones 9, with an average of 3.0 ppM eU, and 14, with 2.6 ppm have above average uranium content. Zone 14 is also the only uranium anomaly with combined U/K and U/T ratio anomalies. No single uranium anomaly is believed to represent an economic follow-up target. The most prospective area appears to be the elongate zone of generally high uranium content, formed by the deposits of the Shaktolik group, to the east of the Ungalik conglomerate. This zone flanks an elongate area of relatively strong shallow magnetic sources, interpreted to be related to a monozonitic intrusive of which the Christmas mountain forms part. This intrusive rock contains in other neighboring areas often high thorium and uranium concentrations and may here as well served as a possible source of uranium deposits. (ERA citation 05:021830)

GJBX-73(80)(V.1) PC **E03**/MF **A01**
Western Geophysical Co. of America, Houston, TX. Aero Service Div.
Airborne gamma-Ray Spectrometer and Magnetometer Survey: Nulato Quadrangle (Alaska). Final Report.
Feb 80, 102p
Contract EY-76-C-13-1664

During the months of July, August, and September 1979, an airborne high sensitivity gamma-ray spectrometer and magnetometer survey was carried out over ten 3 exp 0 x 1 exp 0 NTMS quadrangles of West-Central Alaska. The results obtained over the Nulato map area are discussed. The final data are presented in four different forms: on magnetic tape; on microfiche; in graphic form as profiles and histograms; and in map form as anomoly maps and flight path maps. The histograms and the multiparameter profiles are presented with the anomaly maps and flight path map in a separate volume. (ERA citation 05:023677)

GJBX-76(80)(V.1) PC **E04**/MF **A01**
Western Geophysical Co. of America, Houston, TX. Aero Service Div.
Airborne gamma-Ray Spectrometer and Magnetometer Survey: Medfra Quadrangle (Alaska). Final Report.
Mar 80, 97p
Contract EY-76-C-13-1664

During the months of July, August, and September 1979, an airborne high sensitivity gamma-ray spectrometer and magnetometer survey was conducted over ten 3 exp 0 x 1 exp 0 NTMS quadrangles of West-Central Alaska. The results obtained over the Medfra map area are discussed. The final data are presented in four different forms: on magnetic tape; on microfiche; in graphic form as profiles and histograms; and in map form as anomaly maps, flight path maps, and computer printer maps. The histograms and the multiparameter profiles are presented with the anomaly maps and flight path map in a separate volume. Results from the geochemical analysis indicate that the formation with the highest number of uranium anomalies is the Quarternary alluvium with 34. The geologic formation believed to be the most promising for possible uranium enrichment in the Medfra Quadrangle appears to be unit Tg, Tertiary granitic rocks. By using the criteria outlined in the general section on interpretation, a total of 58 uranium anomalies have been outlined on the interpretation map. Based in part on the criteria discussed in the general interpretation section and in part on the thorium pseudo-contourmap, a total of twelve thorium anomalies have been outlined. Many of the 58 uranium anomalies outlined consist only of anomalous responses of only one of the two uranium/potassium and uranium/thorium ratios, with the other ratio being either normal or anomalous due to very low thorium or potassium values, and with little or no expression on the uranium anomaly map. (ERA citation 05:021835)

GJBX-77(80)(V.1) PC **E04**/MF **A01**
Western Geophysical Co. of America, Houston, TX. Aero Service Div.
Airborne gamma-Ray Spectrometer and Magnetometer Survey: McGrath Quadrangle (Alaska). Final Report.
Mar 80, 103p
Contract EY-76-C-13-1664

During the months of July, August, and September 1979, an airborne high sensitivity gamma-ray spectrometer and magnetometer survey was conducted over ten 3 exp 0 x 1 exp 0 NTMS quadrangle of West-Central Alaska. The results obtained over the McGrath map area are discussed. The final data are presented in four different forms: on magnetic tape; on microfiche; in graphic form as profiles and histograms; and in map form as anomaly maps, flight path maps, and computer printer maps. The histograms and the multiparameter profiles are presented with the anomaly maps and flight path map in a separate volume. (ERA citation 05:021837)

GJBX-78(80)(V.1) PC **E04**/MF **A01**
Western Geophysical Co. of America, Houston, TX. Aero Service Div.
Airborne gamma-Ray Spectrometer and Magnetometer Survey: Ophir Quadrangle (Alaska). Final Report.
Mar 80, 109p
Contract EY-76-C-13-1664

During July, August, and September 1979, an airborne high sensitivity gamma-ray spectrometer and magnetometer survey was conducted over ten 3 exp 0 x 1 exp 0 NTMS quadrangles of West-Central Alaska. The results obtained over the Ophir map area. The final data are presented in four different forms: on magnetic tape; on microfiche; in graphic form as profiles and histograms; and in map form as anomaly maps, flight path maps; and computer printer maps. The histograms and the multiparameter profiles are presented with the anomaly maps and flight path map in a separate bound volume. (ERA citation 05:021839)

GJBX-79(80)(V.1) PC **E04**/MF **A01**
Western Geophysical Co. of America, Houston, TX. Aero Service Div.
Airborne gamma-Ray Spectrometer and Magnetometer Survey: Sleetmute Quadrangle (Alaska). Final Report.
Mar 80, 99p
Contract EY-76-C-13-1664

During the months of July, August, and September 1979 an airborne high sensitivity gamma-ray spectrometer and magnetometer survey was carried out over ten 3 exp 0 x 1 exp 0 NTMS quadrangles of West-Central Alaska. The results obtained over Sleetmute map are discussed. The final data are presented in four different forms: on magnetic tape; on microfiche; in graphic form as profiles and histograms; and in map form as anomaly maps, flight path maps, and computer printer maps. The histograms and the multiparameter profiles are presented with the anomaly maps and flight path map in a separate bound volume. (ERA citation 05:023679)

GJBX-79(80)(V.2) PC **A06**/MF **A01**
Western Geophysical Co. of America, Houston, TX. Aero Service Div.
Airborne gamma-Ray Spectrometer and Magnetometer Survey: Sleetmute Quadrangle (Alaska). Final Report.
Mar 80, 110p

Contract EY-76-C-13-1664

The histograms, multiparameter profiles, anomaly maps, and flight path map from the airborne gamma-ray spectrometer and magnetometer survey of the Sleetmute quadrangle of Alaska are presented. (ERA citation 05:023680)

GJBX-88(79)(V.2)MARFA PC **A12**/MF **A01**
LKB Resources, Inc., Huntingdon Valley, PA.
NURE Aerial gamma-Ray and Magnetic Reconnaissance Survey: Big Bend Area, MARFA MH 13-5, Fort Stockton MH 13-6, Presidio MH 13-8, and Emory Peak MH 13-9 Quadrangles.
Feb 79, 252p
Contract EY-76-C-13-1664

Flight line profile data and statistical analysis result from the NURE aerial gamma-ray and magnetic reconnaissance survey of the Marfa MH 13-5 quadrangle in the Big Bend area of Texas. (ERA citation 04:048160)

GJBX-92(80)(V.2A) PC **E05**/MF **A01**
Carson Helicopters, Inc., Parkasie, PA.
Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Ohio, Pennsylvania and West Virginia: Canton Quadrangle. Final Report.
Mar 80, 147p
Contract EY-76-C-13-1664

The results of a high-sensitivity, aerial, gamma-ray spectrometer and magnetometer survey of the Canton Quadrangle, Ohio, Pennsylvania, and West Virginia, are presented. Instrumentation and methods are described in Volume 1. This work was done as part of the US Department of Energy National Uranium Resource Evaluation (NURE) Program. Statistical and geological analysis of the radiometric data revealed 55 anomalies worthy of field checking as possible prospects. Thirty-seven anomalies coincide with cultural features that may be major contributors to their anomalous values. The Dunkard Series of Permian age has the greatest concentration of anomalies other than Quaternary sedimentary rocks. (ERA citation 05:021848)

GJBX-92(80)(V.2D) PC **E05**/MF **A01**
Texas Instruments, Inc., Dallas.
Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Ohio and West Virginia: Charleston Quadrangle. Final Report.
Mar 80, 189p
Contract EY-76-C-13-1664

The results of a high-sensitivity, aerial, gamma-ray spectrometer and magnetometer survey of the Charleston Quadrangle, Ohio and West Virginia, are presented. Instrumentation and methods are described in Volume 1 of this final report. This work was done as part of the US Department of Energy National Uranium Resource Evaluation (NURE) Program. Statistical and geological analysis of the radiometric data revealed 78 anomalies worthy of field checking as possible prospects. Fourteen anomalies coincide with cultural features that may be major contributors to their anomalous values. The Dunkard Group of Permian Pennsylvanian age has the greatest concentration of anomalies, followed by the Allegheny Formation and Conemaugh and Monongahela groups, both of Pennsylvanian age. (ERA citation 05:021851)

GJBX-92(80)(V.2E) PC **E08**/MF**$4.00**
Texas Instruments, Inc., Dallas.
Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Virginia and West Virginia: Charlottesville Quadrangle. Final Report.
Mar 80, 310p
Contract EY-76-C-13-1664

The results of a high-sensitivity, aerial, gamma-ray spectrometer and magnetometer survey of the Charlottesville Quadrangle, Virginia and West Virginia, are presented. Instrumentation and methods are described in Volume 1 of this final report. This work was done as part of the US Department of Energy National Uranium Resource Evaluation (NURE) Program. Statistical and geological analysis of the radiometric data revealed 26 anomalies worthy of field checking as possible prospects. Ten anomalies coincide with cultural features that may be major contributors to their anomalous values. Seventeen preferred anomalies are in lower Mississippian, upper Devonian strata represented by the Pocono Group, Hampshire Formation, and Chemung Group. All flights were discontinued when encountering the Shenandoah National Park. (ERA citation 05:021852)

GJBX-92(80)(V.2F) PC **E06**/MF**$4.00**
Texas Instruments, Inc., Dallas.
Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Kentucky, Virginia, and West Virginia: Jenkins Quadrangle. Final Report.
Mar 80, 201p
Contract EY-76-C-13-1664

The results of a high-sensitivity, aerial, gamma-ray spectrometer and magnetometer survey of the Jenkins Quadrangle, Kentucky, Virginia, West Virginia, are presented. Instrumentation and methods are described in Volume 1 of this final report. This work was done as part of the US Department of Energy National Uranium Resource Evaluation (NURE) Program. Statistical and geological analysis of the radiometric data revealed 52 anomalies worthy of field checking as possible prospects. Twelve anomalies coincide with cultural features that may be major contributors to their anomalous values. Eight anomalies may be due to late dissipation of low-level inversion conditions and low topographic location. Pennsylvanian and Mississippian sandstone and shales have the greatest concentration of anomalies. (ERA citation 05:021853)

GJBX-99(79)(V.2) PC **A10**/MF **A01**
INCO, Inc., McLean, VA.
Aerial Radiometric and Magnetic Survey: Corpus Christi/Laredo National Topographic Map, Texas Gulf Coast.
1979, 208p
Contract EY-76-C-13-1664

Volume II contains flight line profile data and statistical analysis results from the aerial radiometric and magnetic survey of the Corpus Christi/Laredo National Topographic Map area of the Texas Gulf Coast. (ERA citation 04:049512)

IAEA-R-1145-F(1978) PC **A04**/MF **A01**
International Atomic Energy Agency, Vienna (Austria).
Research within the Coordinated Progamme on Bacterial Leaching of Uranium Ores. Final Report for the Period 1 March 1972 - 31 October 1977.
D. Marjanovic. Jan 78, 51p
U.S. Sales Only.

Effect of magnetic field on the growth rate of Thiobacillus ferrooxidans bacteria was studied at intensities of 30, 100, 2400, and 4000 Oe. Low intensity magnetic field was found to stimulate the bacteria growth rate and the rate of ferrosulphate oxidation with optimum values at 30 to 300 Oe (maximum at 300 Oe). Magnetic field of high intensity (2400, 3200, 4000 Oe) inhibits the growth of bacteria and processes of bacterial oxidation. The possibility was also studied of using biocides for inhibiting bacterial processes in uranium-bearing waste dumps. The use of biocides resulted in a decrease of uranium-bearing waste dump autochthonous microflora density. (Atomindex citation 11:507891)

IS-T-847 PC **A07**/MF **A01**
Ames Lab., IA.
Neutron-Capture gamma-Ray Analysis of Coal for Sulfur, Iron, Silicon and Moisture.
D. A. Fay. May 79, 135p
Contract W-7405-ENG-82
Thesis.

Samples of coal weighing approximately 200 grams placed in a collimated beam of neutrons from the thermal column of the Ames Laboratory Research Reactor produced capture gamma-rays which could be used for the simultaneous determination of sulfur and iron. Spectra from NaI(Tl) and Ge(Li) detectors were used and interferences were located by examining spectra of the major elemental components of coal. In determining sulfur, iron is a potential source of interference when gamma-ray spectra are collected with a NaI(Tl) detector. Corrections for iron interference were made by use of a higher energy iron peak. The possibility of determining silicon in coal was investigated but this element determination was unsuccessful since capture gamma-ray spectrometry lacked the necessary sensitivity for silicon. A linear relation was found between the area of the hydrogen capture peak at 2.23 MeV and the amount of water added to coal. (ERA citation 04:054061)

LA-UR-80-1486 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Magnetotelluric/Audiomagnetotelluric Study of the Zuni Hot Dry Rock Geothermal Prospect, New Mexico.
M. E. Ander, R. Goss, D. Strangway, C. Hillebrand, and A. W. Laughlin. 1980, 5p CONF-800920-1
Contract W-7405-ENG-36
Geothermal Resource Council annual meeting, Salt Lake City, UT, USA, 9 Sep 1980.

The Los Alamos Scientific Laboratory has been investigating a large area in New Mexico for Hot Dry Rock geothermal potential. The area includes parts of the Jemez volcanic lineament and the central Rio Grande rift. LASL has completed a detailed magnetotelluric/audiomagnetotelluric survey covering 161 square km over an area of high heat flow, south of Zuni, NM. The data collection was collected and preliminary analysis phases of a regional MT survey which suggest the Jemez lineament is associated with a crustal structure of anomalously high electrical conductivity. The detailed MT shows an average tipper strike of N60 exp 0 E above 100 sec period, representing the structural trend within Precambrian basement. The Jemez lineament strikes approximately N55 exp 0 E; this suggests a relationship between the Precambrian structure beneath the Zuni area and the Jemez lineament. (ERA citation 05:032093)

LA-UR-80-2086 PC **A02**/MF **A01**
Grace, Sursen, Moore and Associates, Amarillo, TX.
Directional Drilling Equipment and Techniques for Deep Hot Granite Wells.
T. L. Brittenham, G. Sursen, J. W. Neudecker, J. C. Rowley, and R. E. Williams. 1980, 10p CONF-800931-3
Contract W-7405-ENG-36
55. Society of Petroleum Engineers of AIME annual technical conference and exhibition, Dallas, TX, USA, 21 Sep 1980.

Conventional directional drilling technology has been extended and modified to drill the first well of a subsurface geothermal energy extraction system at the Fenton Hill, New Mexico, Hot dry Rock (HDR) experimental site. Completing the first of a two-wellbore HDR system has resulted in the definition of operational limitations of many conventional directional drilling tools, instrumentation and techniques. The successful completion of the first wellbore, Energy Extraction Well No. 2 (EE-2), to a measured depth of 15,300 ft (4.7 km) in granite reservoir rock with a bottomhole temperature of 530 exp 0 F (275 exp 0 C) required the development of a new high temperature downhole motor and modification of existing wireline-conveyed steering tool systems. Conventional rotary-driven directional assemblies were successfully modified to accommodate the very hard and abrasive rock encountered while drilling nearly 8500 ft (2.6 km) of directional hole to a final inclination of 35 exp 0 from the vertical at a controlled azimuthal orientation. (ERA citation 05:032119)

LA-UR-80-2103 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Location of Hydraulic Fractures Using Microseismic Techniques.
J. A. Albright, and C. F. Pearson. 1980, 19p CONF-800931-2
Contract W-7405-ENG-36
55. Society of Petroleum Engineers of AIME annual technical conference and exhibition, Dallas, TX, USA, 21 Sep 1980.

Microearthquakes with magnitudes ranging between -6 and -2 have been observed in three successive massive injections of water at the Hot Dry Rock Geothermal Energy demonstration site at Fenton Hill, New Mexico. The injection was part of a program to increase the heat transfer area of hydraulic fractures and to decrease the flow-through impedance between wells. The microearthquakes were used in mapping the location of the extended hydraulic fractures. A downhole triaxial system positioned approximately 200 m vertically above the injection point in a shut-in production well was used for detection. The microearthquakes occurred in a north-northwest striking zone 400 m in length passing through the injection point. During a third substantially larger injection, microearthquakes occurred in a dispersed volume at distances as great as 800 m from the zone active in the first two injections. (ERA citation 05:032146)

LA-UR-80-551 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Kinetic Behavior of Subbituminous Coal Drying; Effects of Confining Pressure.
L. F. Brown, B. A. Kashiwa, N. E. Vanderborgh, and R. C. Corlett. 1980, 10p CONF-800710-1
Contract W-7405-ENG-36

Drying '80 conference, Montreal, Quebec, Canada, 7 Jul 1980.

A model is developed which explains the drying behavior of a subbituminous coal. This model, a variation of the moving-boundary approach, has the vapor-liquid interface in the macropores receding from the exterior surface of the coal as drying progresses. On the liquid side of the interface, liquid water exists in all three pore systems - macropores, transitional pores, and micropores. On the vapor side of the interface, in the transitional and micropore systems branching off the macropores, the moisture essentially is in equilibrium with the water vapor in the macropore system. Water diffuses from the liquid interface in the macropores through these pores to the exterior surface of the coal. Experiments with a Washington State subbituminous coal are described which test this model. The predictions of the model match the behavior of experimental drying curves. The effective diffusivities obtained were within the range expected for the constricted pore systems which coal possesses. Higher initial stresses apparently decrease the total porosity and increase the severity of pore constrictions. Disparities between model prediction and experimental behavior, which occurred at a late drying time, result from the assumed water adsorption isotherm. (ERA citation 05:023541)

LBL-10839 PC **A05**/MF **A01**
Golder Associates, Inc., Kirkland, WA.
Case Study Data Base Companion Report 3 to Simulation of Geothermal Subsidence (LBL-10571).
I. Miller, W. Dershowitz, K. Jones, L. Myer, and K. Roman. Mar 80, 76p GSRMP-9
Contract W-7405-ENG-48

The data base developed for selection and evaluation of geothermal subsidence case studies is presented. Data from this data base were used in case studies of Wairakei, The Geysers, and Austin Bayou Prospect (Report LBL 10571). (ERA citation 05:032105)

LBL-10861 PC **A04**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
SHAFT79 User's Manual.
K. Pruess, and R. C. Schroeder. Mar 80, 53p
Contract W-7405-ENG-48

SHAFT79 (Simultaneous Heat And Fluid Transport) is an integrated finite difference program for computing two-phase non-isothermal flow in porous media. The principal application for which SHAFT79 is designed is in geothermal reservoir simulation. SHAFT79 solves the same equations as an earlier version, called SHAFT78, but uses much more efficient mathematical and numerical methods. The present SHAFT79 user's manual gives a brief account of equations and numerical methods and then describes in detail how to set up input decks for running the program. The application of SHAFT79 is illustrated by means of a few sample problems. (ERA citation 05:030548)

LBL-10985 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Analysis of Injection Testing of Geothermal Reservoirs.
M. O'Sullivan, and K. Pruess. May 80, 5p CONF-800920-22
Contract W-7405-ENG-48
Geothermal Resource Council annual meeting, Salt Lake City, UT, USA, 9 Sep 1980.

By introducing a similarity variable r/ sqrt t a quasi-analytical method can be used to calculate the flow induced by the injection of cold water into a hot water or boiling geothermal reservoir. The results obtained are compared with those produced by the reservoir simulator SHAFT79 and show good agreement. (ERA citation 05:030576)

LETC-0013-1 PC **A12**/MF **A01**
Sutron Corp., Arlington, VA.
Water Availability for Development of Major Tar Sands Areas in Utah.
T. N. Keefer, and R. S. McQuivey. May 79, 252p
Contract EW-78-S-20-0013

The Sutron Corporation, under contract with Colorado State University, has conducted a study for the Laramie Energy Technology Center (LETC) to determine the availability of water for future extraction of viscous petroleum (bitumen) from the six major tar sands deposits in Utah. Specifically, the areas are: Asphalt Ridge and Whiterocks, which lie immediately west of Vernal, Utah; P.R. Spring, a large area extending from the Colorado River to the White River along Utah's eastern border; Hill Creek, adjacent to P.R. Spring to the west; Sunnyside, immediately across the Green River from Hill Creek between the Price and Green Rivers; and Tar Sand Triangle, near the confluence of the Colorado and Dirty Devil Rivers. The study, conducted between September and December of 1978, was a fact-finding effort involving the compilation of information from publications of the US Geological Survey (USGS), Utah State Engineer, Utah Department of Natural Resources, and other federal and state agencies. The information covers the general physiographic and geologic features of the total area, the estimated water requirements for tar sands development, the availability of water in each of the six areas, and the legal and sociological restraints and impacts. The conclusions regarding water availability for tar sands development in each of the six areas and specific recommendations related to the development of each area are presented also. (ERA citation 05:011276)

METC/SP-79/9 PC **A11**/MF **A01**
Department of Energy, Morgantown, WV. Morgantown Energy Technology Center.
Proceedings of the Second Annual Methane Recovery from Coal Beds Symposium.
R. L. Wise. Apr 79, 243p

Topics covered include methane recovery from coal seams by vertical drilling and by long horizontal drill holes in the seam. Preliminary degassing of the deeper seams may be necessary for safety and productivity in mining them. The recovery of the methane represents the conservation of a resource now largely wasted by venting in mine ventilation air and, in some cases, the economics are favorable. Resource assessment is being carried out and drilling equipment designed for coal seam degassing is described. Seventeen papers from the proceedings have been entered individually into EDB and ERA. (ERA citation 05:011146)

NVO-1558-5(V.2) PC **A06**/MF **A01**
Gruy Federal, Inc., Houston, TX.
Atlantic Coastal Plain Geothermal Test Holes, North Carolina. Hole Completion Reports.
L. B. Cobb, L. Radford, and M. Glascock. Mar 79, 117p
Contract ET-78-C-08-1558

Intermittent drilling operations were carried out in North Carolina beginning October 10, 1978 and ending January 23, 1979. A total of eleven holes were completed during this period. Several holes including Sites 16-A, 15, 14 and 14-A were cased with 2-7/8" EUE tubing and left for reentry and subsequent coring operations by VPI and SU. The remainder of the North Carolina holes were cased with 4-1/2" seamless casing, wellhead equipment installed to permit geothermal test measurements, and left filled with water containing corrosion inhibitor. (ERA citation 05:015579)

N82-11516/3 PC **A04**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Geologic Considerations in Underground Coal Mining System Design.
F. A. Camilli, D. P. Maynard, A. Mangolds, and J. Harris. 1 Oct 81, 52p NASA-CR-164961, JPL-PUB-81-74
Contracts NAS7-100, DE-AI01-76ET-12548

Geologic characteristics of coal resources which may impact new extraction technologies are identified and described to aid system designers and planners in their task of designing advanced coal extraction systems for the central Appalachian region. These geologic conditions are then organized into a matrix identified as the baseline mine concept. A sample region, eastern Kentucy is analyzed using both the developed baseline mine concept and the traditional geologic investigative approach.

ORAU-168 PC **A04**/MF **A01**
Oak Ridge Associated Universities, Inc., TN. Manpower Education, Research and Training Div.
Coal Mine Labor Productivity: Mine-Level Data from Pike County, Kentucky, and Other Selected Counties.
R. J. Gaston, J. G. Baker, R. C. Bishop, and L. M. Blair. Jul 80, 51p
Contract AC05-76OR00033

The mine-level examination of Pike County and other selected counties generally supports and nowhere contradicts the state-level and mine-level results obtained by Baker for Illinois and Ohio. In addition, the mine-level data from DOE's Coal Information System allows the examination of the influence of price per ton on individual mine productivity. In general, price had a significant negative effect, both with the pooled and cross-sectional data. The influence of mine turnover on productivity and other mine characteristics was also examined with the DOE Coal System data. The results gave virtually no support to the hypothesis that less efficient mines entering in a period of high prices contributed to depressed average labor productivity. (ERA citation 05:033232)

PB82-109901 PC **A14**/MF **A01**
Berger Associates, Inc., Harrisburg, PA.
Coal Cooperative Efficiency Program: Small Mine Operations.
Final rept.,
John Multcher. Sep 80, 311p ARC-77-203-5897

This study researched the concept of small coal operators combining to form a coal cooperatives as a means of providing services and to improve their economic position in coal markets. A small coal operators attitude survey was completed in Appalachia, along with actual interviews of numerous operators in two case study areas--Clearfield, Pennsylvania, and Beckley, West Virginia. A profile of small operator facilities and operations was developed along with suggested coal cooperative configurations in the two case study areas. A general administrative services co-op was suggested for the Beckley area and a capital intensive coal processing/transloading co-op for the Clearfield area. From a review of the vast experience in U.S. agricultural cooperatives a step-by-step procedure for forming a coal co-op is detailed from the idea stage to the first Board of Director's meeting. An extensive economic analysis is included to demonstrate potential member benefit-costs. Recommendations are made to operator, state, regional and federal sectors to develop demonstration coal cooperatives to further prove out the concept.

PB82-128729 PC **A04**/MF **A01**
National Inst. for Metallurgy, Randburg (South Africa).
Multivariable Control of a Milling Circuit at East Driefontein Gold Mine,
D. G. Hulbert, and M. Braae. 14 Aug 81, 57p NIM-2113, ISBN-0-86999-545-6

In an investigation into the control of an industrial milling circuit, a preliminary study was made with the use of a computer simulation. Step tests were then carried out on the plant, and the data obtained were used for the derivation of a linear dynamic model. A multivariable controller was designed for the plant by a suite of interactive computer programmes that included the use of techniques involving the inverse Nyquist array. This controller was successfully applied to the plant by digital computer, and there was very good agreement between the theoretical predictions and the practical application of the controller. The quality of control was also good. While the control scheme involves local control of sump levels and cascade control of feed rates, the most important of the variables that can be controlled to any practically feasible operating points are the flow and density of the feed to the primery cyclones, and the product size, which can be measured online.

PB82-132515 PC **A06**/MF **A01**
Foster-Miller Associates, Inc., Waltham, MA.
Development of a Man and Supply Hoisting System for Underground Metal and Nonmetal Mines. Volume II. Operation and Maintenance Manual.
Final rept.,
David J. Hoadley, and Billy C. Brunelle. Apr 81, 103p BM-7526
Contract H0252068
See also Volume 1, PB82-113366.

This report is a supplement to Development of a Man and Supply Hoisting System for Underground Metal and Nonmetal Mines - Volume 1 Technical Report. The report provides a system description, a step-by-step installation, and operating and maintenance procedures.

PB82-133372 PC **A02**/MF **A01**
National Inst. for Metallurgy, Randburg (South Africa).

The Investigation of a Fracture on One Side of a Skip Bridle in a Mine Shaft,
D. D. Howat. 7 Aug 81, 22p NIM-2110, ISBN-0-86999-543-X

Component sections from the fractured side of a skip bridle were submitted to the National Institute for Metallurgy for examination. The fracture had occurred at the junction of the side of the bridle with the top crosshead. Examination indicated that the fracture had resulted from the combined effect of impact on the side of the bridle by the base of the hook and severe corrosion by acid mine water. Certain aspects of the design are commented upon, and suggestions are made as to modifications that might prevent the recurrence of such a fracture. Modifications to the design of the skip bridle, as proposed by the resident engineer of the mine, are described in an appendix.

PB82-135518 PC **A06**/MF **A01**
Bureau of Mines, Spokane, WA. Spokane Research Center.
Factor of Safety Charts for Estimating the Stability of Saturated and Unsaturated Tailings Pond Embankments.
Rept. of investigations,
D. R. Tesarik, and P. C. McWilliams. Oct 81, 110p BUMINES-RI-8564

The factor of safety, the traditional measure of stability for earth embankments, is graphically presented in factors of safety charts in this Bureau of Mines report. Factor of safety contours are drawn for homogeneous earth embankments for two contrasting situations: (1) no phreatic surface and (2) a phreatic surface that assumes 10-pct freeboard. The factor of safety can be read directly from the charts if the physical properties of the soil and the geometry of the embankment are known. The curves provide a quick first approximation of the 'most stable' and 'least stable' condition of the embankment. The Simplified Bishop Method was used for the safety factor calculations, and a sequence of least squares curve fitting steps was used to present the factor of safety in final chart form.

PB82-135583 PC **A03**/MF **A01**
Bureau of Mines, Twin Cities, MN. Twin Cities Research Center.
Water Jet Perforation: A New Method of Completing and Simulating In situ Leaching Wells.
Rept. of investigations,
George A. Savanick, and Walter G. Krawza. Oct 81, 37p BUMINES-RI-8569

The Bureau of Mines has designed, fabricated, and field tested a water jet cutting device capable of perforating nonmetallic well casings for the purpose of completing or stimulating in situ uranium leaching wells. The device is lowered into the wellbore, where it issues a high-velocity water jet that penetrates either a polyvinyl chloride or fiberglass casing, cement, and from 1 to 4 feet into the surrounding uraniferous sandstone. The resulting perforations allow leaching solution to pass between the sandstone and the wellbore. This report describes the water jet perforator, tells how it is used, presents cost data, and discusses the results of laboratory and field tests. The tests were designed to (1) determine the optimum operating conditions for water jet perforation, (2) assess the effects of changes in these conditions, (3) evaluate the performance of the water jet perforator under actual conditions, and (4) compare this method with other methods of well completion. These tests showed that water jet perforation is superior to conventional well completion methods for selectively achieving communication between the wellbore and adjacent sand while maintaining sand control, for restoring permeability lost through wellbore damage, for stimulating poorly performing wells for completing wells with casings that have inside diameters as small as 2 inches, and for extending the effective well diameter.

PB82-135724 PC **A02**/MF **A01**
Bureau of Mines, Pittsburgh, PA. Pittsburgh Research Center.
The Water Spray Cooler - An Update.
Technical progress rept.,
Edward D. Thimons, and J. Harrison Daniel. Oct 81, 14p BUMINES-TPR-114

The water spray cooler is a direct-contact air-to-water heat exchanger designed to cool the hot working areas of deep mines. This cooler was originally developed by the Bureau of Mines. Recent tests with water spray coolers at the Homestake gold mine in South Dakota proved their thermal performance to be superior to that of the conventional finned coil coolers in use at the mine. Testing has also shown that water spray coolers require little maintenance, whereas finned coil coolers need maintenance for dust removal every 2 weeks.

PB82-136995 PC **A13**/MF **A01**
Skelly and Loy, Harrisburg, PA.
Technical and Economic Evaluation of Mine Closure Procedures.
Open file rept. (Final) 27 Sep 78-30 Jun 80,
George Akens, John Metz, and Paul Bilzi. Jun 80, 281p BUMINES-OFR-153-81
Contract J0285030

The purpose of this report is to provide industry with a document to aid in the selection of a closure method and to aid government officials in evaluating closure methods that have been used in the past. The types of seals presently in use for numerous engineering environmental and economic parameters were evaluated. A survey of State and Federal regulations pertaining to mine closure is included. Numerous drawings are also included along with several case histories of mine closures.

PB82-138660 PC **A04**/MF **A01**
Bureau of Mines, Washington, DC.
Evaluation of the Seismic System for Locating Trapped Miners.
Rept. of investigations,
John Durkin, and Roy J. Greenfield. 1981, 62p BUMINES-RI-8567
Library of Congress catalog card no. 81-2170.

This report discusses the configuration and system deployment for the postdisaster surface seismic system for detecting and locating trapped miners. It analyzes the results of 15 field tests to define a signal model, background noise levels, and subarray performance. A waveform modeling procedure is described and compared with observed waveforms. The resulting similarity indicates that the major factors affecting the signal amplitude, waveform, and spectral character are understood. A model is presented which gives the signal amplitude as a function of source type, source depth, and horizontal offset between source and receiver. Using this model a curve is presented which gives the range at which a signal will be detected for different signal and noise levels. Finally, and most important relative to the mission of the system, the ability of the system to detect signals on one or more subarrays is put into a probabilistic framework. For a strong source it is almost certain that a subarray directly over the source will detect the signal. After signal processing, it is highly likely that signals will be detected on sufficient subarrays to locate the trapped miner. Location errors have been found to be less than 100 ft in the majority of cases. Techniques have been used that can reduce the location errors to this level even when soil layer variation between subarrays is severe.

PB82-140104 PC **E11**/MF **E11**
Commission of the European Communities, Luxembourg.
Coal Transportation: An Analysis of Cost and Energy Requirements (Sicherheitsaspekte einer Kuenftigen Europaeischen Wasserstoff-Technologie).
Final rept.
c1980, 279p EUR-6854-DE
Text in German.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

A method of energy analysis is presented and applied to two different coal transport systems: slurry pipelines and unit trains. It covers different transport length assumptions as well as a wide range of bulk handling capacities, all in relation to realistic projects already considered in feasibility studies. Two different types of environment have been examined, the American and European, and a sensitivity analysis has been conducted on those parameters which may play an important role from the energy point of view. The necessity is underlined to conduct an energy analysis to integrate technical-economic factors, as well as the importance of assessing the results of both of these analyses.

PB82-140138 PC **E06**/MF **E06**
Commission of the European Communities, Luxembourg.

Feasibility of the Connection of Wells in Hot Dry Rocks by Means of Hydraulic Fracturing Techniques: Experimental Research Dealing with Three-Dimensional Crack Interaction, Largely Utilizing Photoelastic Techniques.
Final rept.,
G. F. Camponuovo, and R. Riccioni. c1981, 129p EUR-7062-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Heat-exchange in hot dry rocks (HDR) has been analyzed by experimental and numerical tests of propagation and interaction of pressurized 3D cracks in an elastic medium. Two types of models in polyester and epoxy resin were made and penny-shaped cracks created in pre-established positions. Three configurations were investigated -- a single crack, simulating a penny-shaped crack generated at the bottom of a well by hydraulic fracturing; two co-planar cracks, simulating fractures from two wells with good alignment in the direction of the highest in situ stress; and two parallel cracks in planes, simulating poor alignment of the two-wells with respect to the direction of the highest in situ stress.

PB82-146358 PC **A08**/MF **A01**
Bureau of Mines, Washington, DC.
Underground Metal and Nonmetal Mine Fire Protection, Proceedings: Bureau of Mines Technology Transfer Seminars, Denver, Colorado, November 3, 1981, and St. Louis, MO., November 6, 1981.
Information circular.
Nov 81, 156p IC-8865

These proceedings consist of an overview of the underground metal and nonmetal mine fire protection research currently being conducted by the Bureau of Mines. The following papers address the areas of prompt, reliable fire detection, fire planning and warning, fire suppression, and personnel protection. Selected topics are included here that cover fire protection systems for shafts, underground fueling areas, and mobile underground mining equipment; spontaneous combustion, improved stench, and product-of-combustion fire warning systems; computer-aided ventilation modeling; fire doors; and an investigation of fire hazards in mine timbers. The projects described provide a current documentation of problems being addressed.

PB82-858739 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Flotation Separation of Metallic Sulfide Particles. 1966-1981 (Citations from the Metals Abstracts Data Base).
Rept. for Jan 66-Dec 81.
Dec 81, 115p

Topics in this bibliography include flotation separation processes of sulfide particles by causing selected particles to float by using different surface chemical properties. Nickel, copper, zinc, and iron sulfide are among the metallic sulfur compounds examined with reference to particle separation by froth flotation, foam separation, and foam flotation processes. Testing procedures and performance evaluations of the flotation process variations of the sulfides are included. The thermodynamics involved in the wetting behavior and flotation of sulfide minerals are discussed. (Contains 172 citations fully indexed and including a title list.)

PB82-858820 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Flotation Separation of Coal Concentrates. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 211p
Prepared in cooperation with the Department of Energy, Washington, DC.

Reports are cited which discuss flotation separation of mineral particles using the different surface chemical properties to cause the selected particles to float. Coal-washery flotation circuits are emphasized. Sorting and separating using compressed air jets into the mineral concentration, flotation reagent effects on coal concentrate quality, and economy of flotation separation of coal concentrates are included in this bibliography. Froth flotation, foam separation, and foam flotation processes are included with respect to oil and

water mixtures, ore concentrates, and minerals, as well as coal concentrates. (Contains 213 citations fully indexed and including a title list.)

PB82-859026 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Terrestrial Heat Sources for Geothermal Energy. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for Jan 75-Dec 81.
Dec 81, 294p

Citations in this bibliography cover research, development, and demonstration concerning the evaluation and exploitation of various terrestrial heat sources for geothermal energy. Some consideration is given to advances in techniques and technology and to modelling and simulation for geothermal reservoirs. Geophysical prospecting for geothermal resources is excluded. (Contains 262 citations fully indexed and including a title list.)

PB82-859232 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Flotation Separation of Mineral Particles. 1972-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 72-Dec 81.
Dec 81, 99p

This bibliography contains citations concerned with the separation of mineral concentrates from hydrometallurgical solutions, solid residues, and other concentrate media. Differences in surface chemical properties of the various particles, including those whetted by water and those not, are examined. Contrast and comparison, and performance evaluations of mineral particle separation are included regarding froth flotation, foam separation, and foam flotation processes. (Contains 93 citations fully indexed and including a title list.)

8J. Physical Oceanography

AD-A107 025/9 PC **A02**/MF **A01**
Hawaii Inst. of Geophysics, Honolulu.
Pacific Pleistocene Paleoclimatic Stratigraphies: A Comparative Analysis of Results,
Mark J. Valencia. 17 May 76, 17p Rept no. HIG-CONTRIB-758
Contract N00014-70-A-0016
Pub. in Quaternary Research, v8 p339-354 1977.

No abstract available.

AD-A107 028/3 PC **A02**/MF **A01**
Hawaii Inst. of Geophysics, Honolulu.
Geoacoustic Modeling of Deep-Sea Carbonate Sediments,
Phillip Milholland, Murli H. Manghnani, Seymour O. Schlanger, and George H. Sutton. 12 Feb 80, 12p
Rept no. HIG-CONTRIB-1082
Contract n00014-75-C-0209
Pub. in Jnl. of the Acoustical Society of America v68 n5 p1351-1360 Nov 80.

No abstract available.

AD-A107 080/4 PC **A24**/MF **A01**
Electronics Research Lab., Adelaide (Australia).
Proceedings of the Fourth Laser Hydrography Symposium 30 September - 3 October 1980 at Defence Research Centre, Salisbury, South Australia and Royal Australian Navy Hydrographic Office, North Sydney, New South Wales.
Special document,
Mike F. Penny, and David M. Phillips. Mar 81, 566p
Rept no. ERL-0193-SD

At this Symposium, research on laser hydrography and related development programs currently in progress in the United States of America, Canada, and Australia, were reported. The depth sounding systems described include the US Airborne Oceanographic Lidar and Hydrographic Airborne Laser Sounder, the Canadian Profiling Lidar Bathymeter, and the Australian Laser Airborne Depth Sounder. Other papers presented research on blue-green lasers, theoretical modelling, position fixing, and data processing. (Author)

AD-A107 118/2 PC **A03**/MF **A01**
Australian Oceanographic Data Centre, North Sydney.
Australian Oceanographic Data Centre. Bulletin 15.
Jul 81, 27p
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Contents: Bathythermal Data Bank; Requests for Information; ROSCOP; IGOSS; IGOSS - Australian National Report; Real Time Ocean Analysis off the NSW Coast; A Drop in the Ocean; Electronic Data Processing Aspects of Fisheries Information; and The Laser Airborne Depth Sounder and Charting in Australia.

AD-A107 209/9 Not available NTIS
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
International One-Atmosphere Equation of State of Seawater,
Frank J. Millero, and Alain Poisson. 21 Aug 80, 6p
Rept no. CONTRIB-2660
Contract N00014-75-C-0173, Grant NSF-GA40532
Availability: Pub. in Deep-Sea Research, v28A n6 p625-629 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 220/6 Not available NTIS
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
The Density of Caspian Sea Waters,
Frank J. Millero, and Peter V. Chetirkin. 24 Apr 79, 8p Rept no. REPRINT-2480
Contract N00014-75-C-0173, Grant NSF-OCE77-28546
Availability: Pub. in Deep-Sea Research, v27A n3/4 p265-271 1980 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 221/4 Not available NTIS
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
A New High Pressure Equation of State for Seawater,
Frank J. Millero, Chen-Tung Chen, Alvin Bradshaw, and Karl Schleicher. 29 Nov 78, 11p Rept no. REPRINT-2479
Contract N00014-75-C-0173, Grant NSF-OCE73-00351
Availability: Pub. in Deep-Sea Research, v27A, n3/4 p255-264 1980 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 390/7 Not available NTIS
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
The Carbonate System in the Western Mediterranean Sea,
Frank J. Millero, John Morse, and Chen-Tung Chen. 20 Feb 79, 10p
Contract N00014-75-C-0173, Grant NSF-OCE73-00351
Availability: Pub. in Deep-Sea Research, v26A p1395-1404 1979 (No copies furnished by DTIC/NTIS).

No abstract available.

PB82-140195 PC **A14**/MF **A01**
Lamont-Doherty Geological Observatory, Palisades, NY.
ISLAS ORCADAS Cruise 16, April-May 1978. Hydrographic Stations 178-250.
Technical rept.,
Bruce A. Huber, Sarah E. Rennie, Daniel T. Georgi, and Stanley S. Jacobs. 1981, 309p CU-3-81-TR3, ANTARCTIC BIBLIOGRAPHY-J-25365
Grants NSF-DPP76-81240, NSF-DPP78-24832

During the period Oct. 1976 to May 1978, personnel from Lamont-Doherty Geological Observatory participated in four cruises aboard ARA Islas Orcadas. The physical oceanographic component of these cruises were designed to investigate the circulation and distribution of water masses in the Atlantic sector of the southern ocean. 205 stations were occupied, and Conductivity, Temperature, Depth profiles and discrete water samples were taken at each station, and are included in the report.

8K. Seismology

AD-A106 991/3 PC **A11**/MF **A01**
Global Marine Development, Inc., Newport Beach, CA.
Marine Seismic System At-Sea-Test Deployment Operation. Revision.
Final rept. Mar-Apr 81,
Robert L. Wallerstedt. 9 Oct 81, 226p Rept no. RPT-006-007-REV-O
Contract N00014-80-C-0821, ARPA Order-3693
Revision of report dated 1 Jul 81.

This report summarizes the MSS At-Sea-Test Deployment Operations conducted from the DSDP Glomar Challenger during late March 1981. The Borehole Instrumentation Package(BIP) seismic package was successfully emplaced into and recovered from a 15,000 foot water depth borehole located in the Mid-Atlantic. Good reentry and downhole seismic data was obtained. This report covers the design of the deployment equipment, the At-Sea operational procedures utilized, deployment test data and evaluation, mobilization/demobilization considerations, plus the At-Sea-Test Plan, Interface Specification, and drawings of deployment equipment.

AD-A107 005/1 PC **A02**/MF **A01**
Southeastern Massachusetts Univ., North Dartmouth. Dept. of Electrical Engineering.
Geophysical Signal Recognition,
C. H. Chen. 1981, 6p
Availability: Pub. in Conference Records Oceans, p1056-1061, 16-18 Sep 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 273/5 PC **A02**/MF **A01**
California Inst. of Tech., Pasadena. Seismological Lab.
The Bermuda Earthquake of March 24, 1978: A Significant Oceanic Intraplate Event,
G. S. Stewart, and D. V. Helmberger. 29 Jul 80, 12p
CONTRIB-3337, AFOSR-TR-81-0720
Contracts F49620-81-C-0008, N00014-76-C-1070
Pub. in Jnl. of Geophysical Research, v86 nB8 p7027-7036, 10 Aug 81. Sponsored in part by Grant NSF-EAR78-1486.

No abstract available.

AD-A107 360/0 PC **A05**/MF **A01**
Systems, Science and Software, La Jolla, CA.
Seismological Discrimination and Yield Determination Research.
Final rept. 30 Sep 79-30 Sep 80,
T. C. Bache, T. G. Barker, N. Rimer, J. T. Cherry, and W. E. Farrell. Jun 81, 94p SSS-R-81-5033, VSC-TR-81-21
Contract F08606-79-C-0008, ARPA Order-2551

This report summarizes work conducted by Systems, Science and Software concerning the generation, propagation, detection and analysis of seismic waves by both nuclear explosions and earthquake sources. Specific topics covered included numerical simulation of the near field ground motion from earthquakes and explosions, automatic signal processing relating to the detection of seismic events and magnitude determination, a compilation of near source data and the synthesis of this data in terms of the seismic source function, and the determination of the spectral characteristics of acoustic waves from an explosion near the ocean surface. (Author)

NUREG/CR-2411 PC **A06**/MF **A01**
Nebraska Univ.-Lincoln. Inst. of Agriculture and Natural Resources.
Regional Tectonics and Seismicity of Eastern Nebraska.
Annual rept. Jul 80-Jun 81,
R. R. Burchett. Nov 81, 110p
See also report for Jul 79-Jun 80, NUREG-CR-2132.

This annual report presents and interprets the information obtained by the Conservation Survey Division (Nebraska Geological Survey) during contract year July 1, 1980 to June 30, 1981, under contract NRC 04 76 315 with the USNRC. The information pertains to the geology, structure, tectonics, and seismicity of eastern Nebraska with emphasis on central Otoe County. Some of the information presented here result from a combination of studies begun in earlier years but the greater part results from studies begun during the contract

year. The scope of the studies is summarized as follows: rock outcrops in Otoe County were reexamined and reevaluated, and 22 test holes were drilled to determine the altitude of the upper surface of the Elmont Limestone of Pennsylvanian age; one new seismograph was installed in eastern Nebraska; gravity surveys in eastern Nebraska were extended; ground magnetic surveys in Otoe County were made and evaluated, and age dating of two Precambrian cores was accomplished. Discussion of the results of these studies constitute the remainder of this report.

N82-11695/5 PC **A07**/MF **A01**
Texas Univ. at Arlington. Inst. for Geophysics.
Crustal Deformation and Seismic Measurements in the Region of Mcdonald Observatory, West Texas.
Final Technical Report.
H. J. Dorman. 30 Jun 81, 134p NASA-CR-164964
Grant NSG-7159

The arrival times of regional and local earthquakes and located earthquakes in the Basin and Range province of Texas and in the adjacent areas of Chihuahua, Mexico from January 1976 to August 1980 at the UT'NASA seismic array are summarized. The August 1931 Texas earthquake is reevaluated and the seismicity and crustal structure of West Texas is examined. A table of seismic stations is included.

PB82-135393 PC **A03**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Trusted Interval in the Fourier Spectra of Accelerograms Digitized Either Manually or by Semi-Automatic Means (Intervalo Confiable en el Espectro de Fourier Obtenido de Acelerogramas Digitizados Manualmente o Con Medios Semiautomaticos),
Arturo Arias, and Horacio Sandoval. 1981, 50p 434
Text in Spanish.

A theoretical study is made of the effects of random digitization errors on the Fourier amplitude spectra of accelerograms or seismograms digitized either manually or by semi-automatic means. It is found that these effects may be split into three components. Two of them are due to errors of measurement of the trace ordinates: the first one is digitization errors by themselves whose behavior may be considered as white noise, while the second is the uncertainty caused in the definition of the reference line, and has marked influence at the lower frequency end of the spectrum. The remaining component is associated with errors of measurements of time (abscisae) and is relevant in the higher frequency range. This analysis allows the definition of a central reliable frequency band for the Fourier amplitude spectra in terms of the length of the record and the standard digitization error. Some comparisons with experimental results are offered.

PB82-858515 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Regional Seismicity. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 84p
Supersedes PB81-850935. Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography covers principles, observations, and analyses of regional seismic phenomena. Consideration is given to seismic mechanisms, effects, risk, protection, and chronology on a regional scale. Seismicity of some specific regions around the world is covered. (This updated bibliography contains 74 citations, 21 of which are new entries to the previous edition.)

8L. Snow, Ice, and Permafrost

AD-A106 985/5 PC **A03**/MF **A01**
National Research Council of Canada, Ottawa (Ontario). Div. of Mechanical Engineering.
Cutting Ice with High Pressure Water Jets (Decoupage de la Glace par de Puissants Jets D'eau).
Mechanical engineering rept.,
D. B. Coveney. Jul 81, 43p DME-MD-57, NRC-19643
Summary in French.

The potential of high pressure water jets to cut slots in an ice sheet, primarily for possible use as an assist to ice breaking, has been under investigation. In the field, slots have been cut into and through fresh water ice, about 0.7 m thick with water jets applying up to about 260 kW of power to the ice. This report describes the ice cutting performance of small to moderate scale water jets. The majority of cuts produced a narrow, clean kerf, indicative of erosion in a ductile material, while other cuts produced a wide spalled trench, indicative of spalling in a brittle material. Still others produced a combination of the two modes of cutting, with a wide, shallow trench and a narrow, deep kerf below the trench. In many cases the ice was also crazed extensively by the water jet. The causes and the effects of these characteristics on ice cutting performance are discussed, along with the effects of jet traverse speed, nozzle diameter, nozzle pressure, nozzle standoff, ice characteristics and the overall scale of the system. An empirical relationship, derived by regression analysis, is presented correlating the jet penetration to the power in the jet, the jet traverse speed, the nozzle stand-off and the estimated ice temperature.

AD-A107 038/2 PC **A02**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
A Macroscopic View of Snow Deformation under a Vehicle.
Special rept.,
Paul W. Richmond, and George L. Blaisdell. Jul 81, 25p Rept no. CRREL-SR-81-17

For snow with an initial density of less than 0.45 Mg/cu m, load transfer through shallow snow is shown to be attenuated by an interfacial boundary force. Evidence is presented that shows the existence of a density distribution in the deformed area. Results of a laboratory plate-sinkage test on sintered snow support this analysis. Maximum value obtained for the interfacial boundary force range from 1335 to 2670 N when the average density of the deformed area is about 0.5 Mg/cu m.

AD-A107 046/5 PC **A02**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
MIZEX. A Program for Mesoscale Air-Ice-Ocean Interaction Experiments in Arctic Marginal Ice Zones. I. Research Strategy.
Special rept.,
Peter Wadhams, Seelye Martin, Ola M. Johannessen, William D. Hibler, III , and William J. Campbell. Jun 81, 25p Rept no. CRREL-SR-81-19

This document describes the research strategy for a series of mesoscale studies of Arctic marginal ice zones. The main goal of this program is to gain a better understanding of the processes occurring at the ice margin. These processes are relevant to climate, weather forecasting, petroleum exploration and production, marine transportation, naval operations, and commercial fisheries. In addition, MIZEX will aid in determining what modifications to existing ice-ocean-atmospheric models are needed for better prediction near the ice margin. These goals are consistent with recommendations made by international scientific bodies, most notably those of the Joint Scientific Committee (JSC) in its plan for the World Climate Research Programme (WMO-ICSU, 1981). In this document the JSC states that for improved modeling it is necessary: 'To study the physical processes affecting interactions between air, ice and sea at the sea-ice margin and to develop methods for their adequate representation in climate models.' More specific details on initial field programs will be addressed in planning meetings in the near future. In addition, it is anticipated that other aspects of the program, such as modeling, will be addressed in future workshops, with the results distributed in a similar format to this research strategy.

AD-A107 452/5 PC **A10**/MF **A01**
Coast Guard, Washington, DC. Oceanographic Unit.
Oceanography of the Grand Banks Region of Newfoundland, March 1974 - October 1974.
Oceanographic rept.,
Charles R. Weir, R. Q. Robe, R. M. Hayes, and R. W. Scobie. Jul 78, 203p Rept no. USCG-373-74

Two cruises were conducted to the Grand Banks of Newfoundland during the 1974 International Ice Patrol season. The main purpose of these cruises was to assist Commander, International Ice Patrol in the prediction of iceberg drift. Direct current measurements were made in the Ice Patrol area with both subsurface current meter arrays and shipboard current meter stations. A flow onto the Grand Banks was observed in addition to the southerly flowing Labrador Current. An additional research was completed involving the tagging of icebergs and the observation of their drift. (Author)

N82-11510/6 PC **A07**/MF **A01**
Kansas Univ./Center for Research, Inc., Lawrence.
A Model Describing the Microwave Emission from a Multi-Layer Snowpack at 37 Ghz.
M. Abdelrazik, F. Ulaby, and H. Stiles. Feb 81, 136p
NASA-CR-166708, RSL-TR-410-2
Grant NSG-5335

A multilayer emission model is described and applied to emission measurements obtained at 37 GHz and H polarization using a microwave radiometer attached to a truck-mounted boom in Steamboat Springs, Colorado in 1977. Estimated absorption and scattering coefficients and their dependence on wetness were obtained using calculated values of the dielectric constant at 37 GHz along with the model. It was found that the scattering coefficient is comparable in value to the absorption coefficient for dry snow however, the absorption coefficient increases linearly with increasing snow wetness while the scattering coefficient decreases linearly with increasing wetness. The emission from each layer of the snowpack was also calculated using the estimated coefficients. It is shown that for dry snow, the ground underneath the snowpack contributes about 45% of all measured emission while the rest is due to emission from all the layers within the snowpack. When the wetness of the top 5 cm layer of snowpack increases to about 2% by volume, this top 5 cm snowlayer contributes more than 90% of all the measured emission.

PB82-108093 PC **A03**/MF **A01**
Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.
Design Criteria for Avalanche Control Structures in the Runout Zone.
Forest Service general technical rept. (Final),
Arthur I. Mears. Jun 81, 34p FSGTR-RM-84

Guidelines are given for the design and location of deflecting, catching, retarding, and direct protection structures. Terrain, snow conditions, and type and frequency of avalanches are among the most important criteria for planning structural control of avalanches in the lower track and runout zone.

8M. Soil Mechanics

N81-29494/4 PC **A14**/MF **A01**
Lockheed Engineering and Management Services Co., Inc., Houston, TX.
Evaluation of Gravimetric Ground Truth Soil Moisture Data Collected for the Agricultural Soil Moisture Experiment, 1978 Colby, Kansas, Aircraft Mission.
L. M. Arya, and D. E. Phinney. Oct 80, 307p E81-10114, NASA-CR-160966
Contracts NAS9-15800, PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of the Interior, and Agency for International Development. Erts.

Soil moisture data acquired to support the development of algorithms for estimating surface soil moisture from remotely sensed backscattering of microwaves from ground surfaces are presented. Aspects of field uniformity and variability of gravimetric soil moisture measurements are discussed. Moisture distribution patterns are illustrated by frequency distributions and contour plots. Standard deviations and coefficients of variation relative to degree of wetness and agronomic features of the fields are examined. Influence of sampling depth on observed moisture content an variability are indicated. For the various sets of measurements, soil moisture values that appear as outliers are flagged. The distribution and legal descriptions of the test fields are included along with examinations of soil types, agronomic features, and sampling plan. Bulk density data for experimental fields are appended, should analyses involving volumetric moisture content be of interest to the users of data in this report.

N81-29500/8 PC **A02**/MF **A01**
Science and Education Administration, Phoenix, AZ. Water Conservation Lab.

Soil Moisture Inferences from Thermal Infrared Measurements of Vegetation Temperatures.
R. D. Jackson. Mar 81, 14p E81-10184, NASA-CR-160954
Contract PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of Interior, and Agency for International Development. Erts.

Thermal infrared measurements of wheat (Triticum durum) canopy temperatures were used in a crop water stress index to infer root zone soil moisture. Results indicated that one time plant temperature measurement cannot produce precise estimates of root zone soil moisture due to complicating plant factors. Plant temperature measurements do yield useful qualitative information concerning soil moisture and plant condition.

N81-29507/3 PC **A05**/MF **A01**
Lockheed Engineering and Management Services Co., Inc., Houston, TX.
Descriptive and Sensitivity Analyses of Watbali: A Dynamic Soil Water Model.
W. W. Hildreth. Mar 81, 87p E81-10193, NASA-CR-160980
Contracts NAS9-15800, PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of the Interior, and Agency for International Development. Erts.

A soil water computer model that uses the IBM Continuous System Modeling Program III to solve the dynamic equations representing the soil, plant, and atmospheric physical or physiological processes considered is presented and discussed. Using values describing the soil-plant-atmosphere characteristics, the model predicts evaporation, transpiration, drainage, and soil water profile changes from an initial soil water profile and daily meteorological data. The model characteristics and simulations that were performed to determine the nature of the response to controlled variations in the input are described the results of the simulations are included and a change that makes the response of the model more closely represent the observed characteristics of evapotranspiration and profile changes for dry soil conditions is examined.

N82-11513/0 PC **A05**/MF **A01**
Environmental Research and Technology, Inc., Concord, MA.
An Evaluation of the Spatial Resolution of Soil Moisture Information.
Final Report.
K. R. Hardy, S. H. Cohen, L. K. Rogers, H. H. K. Burke, and R. C. Leupold. Mar 81, 83p NASA-CR-166724, ERT-P-7505-F
Contract NAS5-25527

Rainfall-amount patterns in the central regions of the U.S. were assessed. The spatial scales of surface features and their corresponding microwave responses in the mid western U.S. were investigated. The usefulness for U.S. government agencies of soil moisture information at scales of 10 km and 1 km. was ascertained. From an investigation of 494 storms, it was found that the rainfall resulting from the passage of most types of storms produces patterns which can be resolved on a 10 km scale. The land features causing the greatest problem in the sensing of soil moisture over large agricultural areas with a radiometer are bodies of water. Over the mid-western portions of the U.S., water occupies less than 2% of the total area, the consequently, the water bodies will not have a significant impact on the mapping of soil moisture. Over most of the areas, measurements at a 10-km resolution would adequately define the distribution of soil moisture. Crop yield models and hydrological models would give improved results if soil moisture information at scales of 10 km was available.

PB82-109570 PC **A16**/MF **A01**
Michigan State Univ., East Lansing. Dept. of Civil and Sanitary Engineering.
The Resilient and Plastic Characteristics of Michigan Subgrade Soils and Their Soil Support Values.
Final rept.,
Gilbert Y. Baladi, and Tesfai Goitom. Aug 81, 361p FHWA/MI/RD-81-02
Sponsored in part by Michigan Dept. of Transportation, Lansing.

In this study, the plastic and elastic characteristics of Michigan cohesive subgrade soils are evaluated using repeated load triaxial tests on undisturbed samples. The results of the investigation led to the development of a normalized predictive model of the plastic strain. The model has demonstrated its ability to evaluate and predict the plastic behavior of several materials subjected to cyclic loadings. The input parameters of the model consist of the static strength and the corresponding total strain of the material in question. The model was tested and evaluated using five different materials ranging from gravel, sand, clay and clayey silt. The developed normalized predictive model neutralizes the effects of several sample and test variables. The model was found to be unique for each class of soil and independent of compaction, density, water content and stress-level. Further, the model was used to develop a new approach and understanding of the soil support value of the 'Aashto Interim Guide for the Design of Flexible Pavement'.

PB82-126293 PC **A02**/MF **A01**
National Heart, Lung, and Blood Inst., Bethesda, MD.
Atmospheric Benzene Depletion by Soil Microorganisms.
Journal article,
James C. McFarlane, Amy Cross, Clyde Frank, and Robert D. Rodgers. 1981, 9p EPA-600/J-81-402
Pub. in Environmental Monitoring and Assessment 1, p75-81 1981. Prepared in cooperation with Northrop Services, Inc., Las Vegas, NV., Iowa Univ., Iowa City, and Idaho National Engineering Lab., Idaho Falls.

Gaseous benzene was rapidly depleted in exposure chambers containing viable soils and plants. When separate components of the system were analyzed, no benzene was detected in soils, plants, or water. Soil microorganisms were shown to be responsible for metabolizing benzene, yielding CO2 as the main product. The rates were sufficiently rapid to suggest that this reaction forms a major pathway for the elimination of benzene from the environment.

PB82-127549 PC **A02**/MF **A01**
Health Effects Research Lab., Wenatchee, WA. Wenatchee Pesticides Research Branch.
Methyl Parathion Persistence in Soil Following Simulated Spillage.
Journal article,
L. C. Butler, D. C. Staiff, and J. E. Davis. 30 May 80, 10p EPA-600/J-81-337
Pub. in Archives of Environmental Contamination and Toxicology 10, p451-458 1981.

Simulated spillage of emulsifiable concentrate (E.C) and microencapsulated formulations of methyl parathion on soil were studied. Persistence of residues from both formulations spilled as concentrates and as simulated drum rinses were followed for up to 45 months. Spillage of encapsulated formulation resulted in the formulation of a solid cake-like deposit on the soil surface, which could be a particularly attractive hazard to small children. At 45 months, soil residues had decreased by 64% for emulsifiable concentrate spills, and 68% for the soil beneath the microencapsulated cake. Residue in the cake itself only decreased by 31%. Soil residue levels from simulated drums rinses were essentially innocuous by 45 months for the emusifiable concentrate and by one year for the microencapsulated material. The leaching of methyl parathion from the microencapsulated cake into soil and the relationship between available residue and wet weather were investigated.

PB82-134644 PC **A06**/MF **A01**
Cambridge Univ. (England). Dept. of Engineering.
HOMEP - An Algorithm for Analysing Homogeneous Stress/Strain Histories,
C. M. Szalwinski. 1981, 103p CUED/D-SOILS/TR-115-1981
Sponsored in part by Transport and Road Research Lab., Crowthorne (England). Also pub. as ISSN-0309-7439.

An algorithm for transforming strain history into stress history (and vice versa) is described. It is called HOMEP and pertains to a single, homogeneous material element. HOMEP is intended for analyses in soil mechanics where the constitutive relations are significantly nonlinear. Several relations including Modified Cam Clay (of Critical State Soil Mechanics) are available. Its results can be stored on auxiliary file for post-processing by plotting algorithms.

PB82-135401 PC **A03**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Static Penetrometer for Soft and Loose Soils (Penetrometro Estatico Para Suelos Blandos Y Sueltos),
Enrique Santoyo, and Alfredo Olivares. Mar 81, 36p 435
Text in Spanish.

The geometric and electronic characteristics of a conventional static penetrometer are presented. The load capacity of its sensitive cells is adequate for soft cohesive or loose granular soils. A common hydraulic drilling rig is proposed as a driving mechanism of this penetrometer in soft or loose soils. To facilitate interpretation of results obtained with this instrument, a resume of the most accepted methods to obtain shear strength parameters is included.

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-A107 014/3 Not available NTIS
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Mechanical Engineering, Aeronautical Engineering and Mechanics.
Intrinsic Stress in Thin Films Deposited on Anisotropic Substrates and its Influence on the Natural Frequencies of Piezoelectric Resonators,
H. F. Tiersten, B. K. Sinha, and T. R. Meeker. 6 Feb 81, 11p ARO-16498.3-EL
Contract DAAG29-79-C-0088, Grant NSF-ENG78-27637
Availability: Pub. in Jnl. of Applied Physics, v52 n9 p5614-5624 Sep 81. (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 024/2 PC **A02**/MF **A01**
Texas Univ. at Austin. Dept. of Electrical Engineering.
Analysis of Periodic Ferrite Slab Waveguides by Means of Improved Perturbation Method,
Kiyomichi Araki, and Tatsuo Itoh. 5 Aug 80, 6p Rept no. UT-MW-N-81-2
Contract N00014-79-C-0553
Pub. in IEEE Transactions on Microwave Theory and Techniques, vMTT-29 n9 p911-916 Sep 81.

No abstract available.

AD-A107 043/2 PC **A07**/MF **A01**
Michigan Univ., Ann Arbor. Electron Physics Lab.
Properties of High-Efficiency X-Band GaAs Impatt Diodes.
Interim rept. Sep 79-Jan 81,
R. K. Mains, and G. I. Haddad. Jun 81, 128p Tr-147, AFWAL-TR-81-1066
Contract F33615-77-C-1132

Several different IMPATT diode structures operating in the precollection mode at X-band (9 to 11 GHz) are examined, both using a complete finite-difference program and a simplified analysis which is developed in the report. The details of the precollection mode are examined, and large-signal solutions are presented for each different structure. Both single- and double-drift diodes are considered. Dynamic temperature effects are included and the differences between simulations at constant temperature and those with variable temperature are noted. (Author)

AD-A107 133/1 PC **A05**/MF **A01**
Construction Engineering Research Lab. (Army), Champaign, IL.
EMP/EMI Hardening of Electrical Conduit Systems.
Technical rept.,
Paul H. Nielsen. Sep 81, 77p Rept no. CERL-TR-M-292

Properly designed and installed conduit systems can provide an effective EMP/EMI hardening technique for fixed facility construction. This report presents the results of a CERL study to provide design criteria and to conduct hardness assessments for such shielded systems. Leakage mechanisms are identified, and techniques for determining signal levels coupled to conductors inside conduit systems are presented. EMP shielding properties of conduit hardware items are analyzed and some experimental EMP hardened conduit hardware items evaluated. Finally, a number of 'in situ' test techniques for identifying and locating EMP-related defects in an installed conduit system are assessed. (Author)

AD-A107 159/6 Not available NTIS
Colorado State Univ., Fort Collins.
Conceptual Problems in Modeling Submicron Device Physics,
H. L. Grubin, and D. K. Ferry. 23 Mar 81, 6p ARO-17818.2-EL
Contract DAAG29-81-K-0051
Availability: Pub. in Jnl. of Vacuum Science and Technology, v19 n3 p540-544 Sep/Oct 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 309/7 PC **A02**/MF **A01**
Harry Diamond Labs., Adelphi, MD.
Worst-Case Prediction of Single-Particle-Induced Permanent Failures in Microelectronics.
Technical rept. Apr-Sep 80,
Timothy R. Oldham, and James M. McGarrity. Jul 81, 19p Rept no. HDL-TR-1966

In recent years upsets caused by single particles passing through Si integrated circuits have been a serious concern in the semiconductor industry. In this report we calculate the threshold voltage shift caused by a single charged particle passing through the SiO2 layer of a metal-oxide-semiconductor field-effect transistor. This calculation rests on a number of worst-case assumptions: (1) recombination is neglected, (2) charge trapping is taken to be 100-percent efficient, and (3) maximum energy loss per unit path length is assumed. Under these conditions we calculate that permanent failure caused by a single alpha particle is possible in submicrometer-dimension devices. (Author)

AD-A107 392/3 PC **A03**/MF **A01**
General Electric Corporate Research and Development, Schanectady, NY.
Investigation for Low-Cost Permanent Magnets.
Annual rept. 1 Jul 80-30 Jun 81,
J. J. Becker. Sep 81, 48p Rept no. SRD-81-076
Contract N00014-80-C-0566

The crystallization of initially amorphous rapidly quenched alloys may provide new materials with good permanent magnet properties at low cost. Preliminary investigations indicate that phosphorus and carbon are favorable alloying elements, and that sudden changes in properties may occur as the identities of the crystallizing phases change. the exploration of alloy systems has been greatly speeded up by the use of current-pulse annealing. It has been found that remanence ratios may be quite high even though the orientation of the crystals formed is probably random. The course of crystallization has been followed by resistance monitoring in conjunction with current-pulse annealing. X-ray diffraction indicates that the highest coercive forces are attained in only partially crystallized samples. Magnetic domain structures have been studied in crystallized ribbons and also in bulk samples of some of the phases observed in them, using both Kerr effect and magnetic colloid. These studies have given useful information about the nature and the magnitude of the magnetocrystalline anisotropy in the phases formed. Alloys containing rare earth elements appear very promising and are being actively pursued. (Author)

AD-A107 526/6 PC **A03**/MF **A01**
Varian Associates, Inc., Palo Alto, CA. Solid State Lab.
Integrated Balanced FETs for Broadband Millimeter Wave Amplifiers.
Final rept. 1 Apr 80-30 Jun 81,
S. Bandy, C. Nishimoto, P. Stonestrom, Y. Chai, and C. Hooper. Aug 81, 32p
Contract N00014-80-C-0391

Using electron-beam exposure and MBE GaAs, balanced FETs were designed and fabricated. While the devices exhibited excellent dc characteristics, their single-sided rf performance was not up to expectations, for reasons yet to be determined. This report is an interim account of a program being continued under a different contract number (N00014-81-C-0270).

CONF-7909201- PC **A15**/MF **A01**
Consiglio Nazionale delle Richerche, Rome (Italy). Gruppo di Ricerca sulle Macchine Elettriche.
Symposium on Power and Measurement Transformers.
1979, 335p
Symposium on power and measurement transformers, Positano, Italy, 11 Sep 1979.
U.S. Sales Only.

Thirty-eight papers were presented at the meeting. A separate abstract was prepared for each of 8 papers. The remaining 30 papers were not in scope for the data base. (ERA citation 06:022009)

N82-11358/0 PC **A02**/MF **A01**
National Aerospace Lab., Tokyo (Japan).
Application of a Rare-Earth Cobalt Magnet to Synchronous Motors.
H. Yamada. 1981, 11p NAL-TR-656, ISSN-0389-4010
In Japanese; English Summary.

An experimental hysteresis rotor structure was produced in which a ring made of radially oriented anisotropic magnet material, Alnico 5 which has a large magnetic hysteresis loop, and a yoke made of inner steel are utilized. The prototype hysteresis motor has a large ratio of output power to magnet volume and a large starting torque as compared with conventional hysteresis motors. The structure, torque analysis, torque characteristics and equivalent circuit of the synchronous condition of the prototype synchronous motors are discussed. A comparison of the hysteresis and the permanent-magnet-type synchronous motor is also given.

N82-11959/5 PC **A02**/MF **A01**
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Electrical Computer and Systems Engineering.
Low Temperature Growth and Electrical Characterization of Insulators for GaAs MISFETS.
Semiannual Status Report, 1 May - 31 Oct. 1981.
J. M. Borrego, and S. K. Ghandhi. 31 Oct 81, 11p
NASA-CR-164972
Contract NAG3-175

Progress in the low temperature growth of oxides and layers on GaAs and the detailed electrical characterization of these oxides is reported. A plasma anodization system was designed, assembled, and put into operation. A measurement system was assembled for determining capacitance and conductance as a function of gate voltage for frequencies in the range from 1 Hz to 1 MHz. Initial measurements were carried out in Si-SiO2 capacitors in order to test the system and in GaAs MIS capacitors lubricated using liquid anodization.

PATENT-4 263 096
Not available NTIS
Department of Energy, Washington, DC.
Toroidal Magnet System.
Patent,
C. C. Baker, and T. Ohkawa. Filed 27 Dec 77, patented 21 Apr 81, 6p PAT-APPL-864 696
Supersedes PAT-APPL-864 696-77.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

In a plasma device having a toroidal plasma containment vessel, a toroidal field-generating coil system includes fixed linking coils each formed of first and second sections with the first section passing through a central opening through the containment vessel and the second section completing the linking coil to link the containment vessel. A plurality of removable unlinked coils are each formed of first and second c-shaped sections joined to each other at their open ends with their bights spaced apart. The second c-shaped section of each movable coil is removably mounted adjacent the second section of a linking coil, with the containment vessel disposed between the open ends of the first and second c-shaped sections. Electric current is passed through the linking and removable coils in opposite sense in the respective adjacent second sections to produce a net toroidal field. (ERA citation 06:038842)

PB82-858853 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
High Voltage Direct Current Insulators and Insulation Methods. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for Jan 75-Dec 81.
Dec 81, 73p

Citations in this bibliography cover insulation techniques and the design, testing, characteristics, and performance of insulators and insulating materials for use in high voltage direct current (HVDC) installations and equipment. Considerable attention is given to contaminated insulators. Also considered are interference and flashover or sparkover behavior and problems. (Contains 59 citations fully indexed and including a title list.)

9B. Computers

AD-A106 992/1 PC **A02**/MF **A01**
Army Missile Command, Redstone Arsenal, AL. Systems Simulation and Development Directorate.
Addition of Data Feature for FEASIL. Supplement.
Technical rept.,
Maurice M. Hallum, III. Aug 81, 7p Rept no. DRSMI/RD-81-16
Supplement to Rept. no. DRSMI/RD-80-11 dated Jun 80, AD-A086 881.

This report describes the feature to add data to the relational-based Data Management System, FEASIL, developed for the Interdata 8/32. The report describes the feature that provides the ability to add the data in a card image, formal free form. (Author)

AD-A107 078/8 PC **A03**/MF **A01**
Naval Postgraduate School, Monterey, CA.
The Automatic Generation of Syntax Directed Editors.
Technical rept.,
Bruce J. MacLennan. Oct 81, 48p Rept no. NPS52-81-014

A syntax directed editor is an editor oriented towards a particular language. This paper describes a general table-driven syntax directed editor and an algorithm for automatically generating a syntax directed editor for a language from a description of that language. Aside from the convenience of a syntax directed editor, it is also a very efficient parser. No syntactic error recovery is required since the editor does not permit the user to make syntactic errors. Some of the implications of syntax directed editors for data structure manipulation and two dimensional languages are briefly discussed. (Author)

AD-A107 082/0 PC **A03**/MF **A01**
Naval Surface Weapons Center, Dahlgren, VA.
NAVPAC SST Data Processing--Mathematical Description.
Final rept.,
Everett R. Swift. Jul 81, 50p Rept no. NSWC/TR-81-184

The Navigation Package (NAVPAC) is a satellite-borne data collection system consisting of two sensor subsystems: a receiver/data subsystem capable of tracking up to three Navy Navigation Satellites (NAVSATs) simultaneously and recording Doppler, refraction, and timing information and a miniature electrostatic accelerometer capable of measuring accelerations due to atmospheric drag, winds, and orbit adjust thrusts. This report provides a detailed mathematical description of the NAVPAC satellite-to-satellite tracking (SST) data processing procedures that include preprocessing,

preliminary data quality evaluation, and orbit determination. Also included is an overview of the hardware operation required for the correct interpretation of the SST Doppler, refraction, and timing data. (Author)

AD-A107 098/6 PC **A04**/MF **A01**
Honeywell Systems and Research Center, Minneapolis, MN.
Computer Image Generation: Advanced Visual/Sensor Simulation.
Final rept.,
Daivd Serreyn, and David Duncan. Oct 81, 51p
AFHRL-TP-81-23
Contract F33615-80-C-0006

This study investigated, developed, and evaluated various Computer Image Generation (CIG) techniques to overcome the qualitative limitations of current CIG imaginery produced by edge-based systems. The study concluded with an integration of techniques into a system concept. This report describes the techniques investigated, the system concept developed, and the general hardware implementations which are useful for cost/benefit tradeoffs. The system concept presented is based on the use of textured terrain for realistic simulation. In areas where the technique was for training effectiveness and an algorithmically unified system. The approach also involves the display of terrain as curved surfaces represented by bicubic splines. (Author)

AD-A107 104/2 PC **A02**/MF **A01**
Oregon State Univ., Corvallis. School of Oceanography.
Exposure. A Newsletter for Ocean Technologists, Volume 9, Number 4,
Technical rept.,
Roderick Mesecar. Sep 81, 9p
Contract N00014-79-C-0004

This issue of Exposure is composed of the complete text of the Serial ASCII Instrumentation Loop (SAIL) data communications standard as drafted by technical members of the marine research community. Research vessels operating in the federal and university research communities are not outfitted with a common digital methodology to access or exchange operational data. to a large extent, science leadership is based on the widespread availability of instrumentation. In an earlier era, marine scientists could make fundamental discoveries with the equivalent of sealing wax and string. Today, an occasional worthwhile observation is made with simple tools, but the more significant advances now depend on the application of complex instrumentation. In most instances, new instrumentation techniques make possible a tenfold or greater speed in data collections, and in other instances make possible the measurements for experiments before inaccessible. Although this standard has other instrumentation applications, it is presented as one candidate specifically for intravessel digital data communications from sensors that monitor vessel parameters (position, speed, heading, etc.). The marine research community is very diffuse geographically and in research interests, which has partially contributed to the slow development of standard design criteria. However, standardization contributes to efficiency and technology dissemination because standards form the root words of a language for technical information transfer. (Author)

AD-A107 110/9 PC **A02**/MF **A01**
Massachusetts Univ., Amherst. Dept. of Mathematics and Statistics.
Cluster Analysis Algorithms for Image Segmentation.
Technical rept.,
M. F. Janowitz. Jul 81, 20p Rept no. TR-J8102
Contract N00014-79-C-0629

The goal of this research is the investigation of the ability of certain cluster techniques to segment monochromatic data collected by remote sensing devices. The particular example that will be considered consists of temperature data collected by the Air Force Geophysical Laboratory at Hanscom Air Force Base. The work was done on three levels: underlying motivations, simulations, and real data analysis. In this particular paper, we shall restrict our consideration to a single feature, with multiple feature selection to be investigated at a later date. Section 2 presents the motivation for both the cluster techniques and the statistics that they use, while section 3 briefly explains the techniques. In section 4, some simulated data is analyzed, and in section 5, the techniques are applied to actual infrared temperature data. The paper concludes with an indication of possible future directions for the current research effort.

AD-A107 125/7 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
Techniques for Speckle Noise Removal,
Jae S. Lim, and Hamid Nawab. 7 Aug 80, 10p
Contract N00014-75-C-0951
Pub. in Optical Engineering, v20 n3 p472-480 May-Jun 81.

No abstract available.

AD-A107 168/7 PC **A04**/MF **A01**
Royal Signals and Radar Establishment, Malvern (England).
'Pseudo', A Macro-Based High Level Language for the PDP-11,
B. Davy. Apr 74, 66p RSRE-MEMO-2875, DRIC-BR-64523

PSEUDO is a pseudo-high-level language, developed for the PDP-11 computer. The language is extremely efficient and particularly suited to real-time programming applications. (Author)

AD-A107 229/7 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
MNOS/CCD Nonvolatile Analog Memory.
Journal article,
Richard S. Withers, Robert W. Mountain, and Donald J. Silversmith. 30 Mar 81, 3p JA-5242, ESD-TR-81-268
Contract F19628-80-C-0002
Pub. in IEEE Electron Device Letters, vEDL-2 n7 p165-166 Jul 81.

No abstract available.

AD-A107 248/7 Mag Tape $900.00
Rome Air Development Center, Griffiss AFB, NY.
Programming Support Library (PSL).
Software,
Lawrence M. Lombardo. 28 Sep 81, mag tape DOD/DF-81/016
Source tape is in ASCII character set. Character set restricts preparation to 9 track one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions. Price includes documentation, AD-A107 249 - AD-A107 253. Sales restricted to federal, state, and local government. No copies furnished by DTIC.

No abstract available.

AD-A107 249/5 PC **A12**/MF **A01**
IBM Federal Systems Div., Gaithersburg, MD.
Programming Support Library (PSL). Users Manual.
Final rept.
May 78, 272p DOD/DF-81/016A
Contract F30602-77-C-0249
For magnetic tape, see AD-A107 248. See also AD-A107 250.
Available from National Technical Information Service, Springfield, VA 22161. The source agency has restricted sales of this item to Federal, state and local governments. No copies furnished by DTIC.

The Programming Support Library (PSL) is a software system which provides the tools to organize, implement, and control computer program development. This involves the support of the actual programming process and also the support of the management process. The PSL is designed to support Top Down Design and Structured Programming (TDDSP). The Users Manual presents a summary of the PSL system, a description of the PSL processing, and a guide for users of the system. This document is prepared for those who need an overall understanding of the system and for those who need more detailed technical information on the use of the system. (Author)

AD-A107 250/3 PC **A04**/MF **A01**
IBM Federal Systems Div., Gaithersburg, MD.
Programming Support Library (PSL). Technical Report.
May 78, 51p DOD/DF-81/016b
Contract F30602-77-C-0249
For magnetic tape, see AD-A107 248. See also AD-A107 251.

Over the past several years the structured programming technology has gained wide use and acceptance throughout the Department of Defense. The concept of structured programming is to define a program with a single entry point and a single exit point, and to code in such a manner as to develop lower level functions as pieces which plug into higher level functions. By significantly reducing the number of interfaces, potential error points are eliminated. Structured programs tend to be less error prone, easier to read, easier to maintain; these characteristics obviously are attractive to cost-conscious projects with software contents. The structured programming discipline requires tools to support the implementation. Those tools germane to this report include: precompilers which accept structured source code and translate the structure figures into unstructured code acceptable to the respective compiler; and programming support libraries which maintain code at the unit (single page of code) level.

AD-A107 251/1 PC **A03**/MF **A01**
IBM Federal Systems Div., Gaithersburg, MD.
Programming Support Library (PSL). Operations Manual.
Final rept.
May 78, 29p DOD/DF-81/016C
Contract F30602-77-C-0249
For magnetic tape, see AD-A017 248. See also AD-A107 252.

The Programming Support Library (PSL) is a software system which provides the tools to organize, implement, and control computer program development. This involves the support of the actual programming process and also the support of the management process. The PSL is designed to support Top Down Design and Structured Programming (TDDSP). The objective of the Operations Manual for the PSL is to provide computer control and computer operator personnel with a detailed operational description of the system and its associated environment. (Author)

AD-A107 252/9 PC **A14**/MF **A01**
IBM Federal Systems Div., Gaithersburg, MD.
Programming Support Library (PSL). Maintenance Manual. Volume I.
Final rept.
May 78, 304p DOD/DF-81/016D
Contract F30602-77-C-0249
For magnetic tape, see AD-A107 248. See also Volume 2, AD-A107 253.

The Programming Support Library (PSL) is a software system which provides the tools to organize, implement, and control computer program development. This involves the support of the actual programming process and also the support of the management process. The PSL is designed to support Top Down Design and Structured Programming (TDDSP). This Maintenance Manual provides detailed information on PSL program operations, data formats and special procedures to assist programmer personnel in the maintenance of PSL system programs. (Author)

AD-A107 253/7 PC **A12**/MF **A01**
IBM Federal Systems Div., Gaithersburg, MD.
Programming Support Library (PSL). Maintenance Manual. Volume II.
Final rept.
May 78, 262p DOD/DF-81/016E
Contract F30602-77-C-0249
For magnetic tape, see AD-A107 248. See also Volume 1, AD-A107 252.

For abstract see AD-A107 253.

AD-A107 257/8 PC **A09**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
A Statistical Methodology for Constructing Synthetic Test Workloads.
Doctoral thesis,
Wayne Thomas Graybeal. May 79, 178p Rept no. AFIT-CI-79-305D-S

Computer performance measurement and evaluation (CPME) studies are conducted for the purpose of sizing and selecting a new system (selection studies); during the design phase of either a new system or a hardware/software modification to an existing system to assess the impact of the new system/modification (performance projection studies); or to assess and improve the level of performance of an existing system (performance monitoring studies). Nearly all performance measures used are related to the workload being processed by the system. There is the need for a workload which emulates the actual workload, yet executes

in less time and does not compromise the adequacy of the measurements. Such a workload is called a drive or test workload. A statistical methodology is proposed to aid in the construction of a test workload.

AD-A107 299/0 Mag Tape $900.00
Air Force Data Systems Design Center, Gunter AFS, AL.
Selective Inquiry System/Timesharing Retrieval Subsystem.
Software,
Paul J. Bart. 8 Nov 80, mag tape DOD/DF-81/017
Source tape is in Honeywell BCD character set. Character set restricts preparation to 9 track one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions. Price includes documentation, AD-A107 300. Sales restricted to federal, state and local government. No copies furnished by DTIC.

The Selective Inquiry System (SIS) is a generalized retrieval system designed for the reporting of data from single or multiple files in a batch environment. Input files may be sequential or indexed sequential. Data can be sorted on up to 20 keys prior to producing the report. A subsystem, TRS, is available for use through the facilities of the timesharing executive of the operating system. Software Description: The system is written in the GMAP programming language for implementation on a Honeywell 6000 computer using the WWMCCS GCOS 6.4 operating system. The computer memory requirement is 16k.

AD-A107 300/6 PC **A08**/MF **A01**
Air Force Data Systems Design Center, Gunter AFS, AL.
Selective Inquiry System (SIS). Operation Manual and Users Manual.
Mar 78, 153p AFM-171-714-VOL-1, DOD/DF-81/017a
Supersedes Rept. no. AFM-171-714-VOL-1 dated 1 Mar 77. For magnetic tape, see AD-A107 299.

The Selective Inquiry System (SIS) is a generalized retrieval system designed for the reporting of data from single or multiple files in a batch environment. Input files may be sequential or indexed sequential. Data can be sorted on up to 20 keys prior to producing the report. A subsystem, TRS, is available for use through the facilities of the timesharing executive of the operating system. This manual establishes procedures for utilization of the Selective Inquiry System (SIS) and the Timesharing Retrieval Subsystem (TRS) on the H6000 computer. It applies to all functional user personnel who have a requirement for batch and/or online retrievals from data bases resident on the H6000 computer. The information in this manual is used in conjunction with the Computer Directed Training System (CDTS) course designed to teach the use of SIS.

AD-A107 328/7 PC **A04**/MF **A01**
Stanford Univ., CA. Dept. of Computer Science.
Deductive Synthesis of the Unification Algorithm,
Zohar Manna, and Richard Waldinger. Jun 81, 52p Rept no. STAN-CS-81-855
Contract N00014-76-C-0687, Grant AFOSR-81-0014
Prepared in cooperation with SRI International, Menlo Park, CA. Artificial Intelligence Center, Contract N00014-75-C-0816 and Weizmann Inst. of Science, Rehovoth (Israel). Sponsored in part by Grants NSF-MCS78-02591 and NSF-MCS79-09495.

the deductive approach is a formal program-construction method in which the derivation of a program from a given specification is regarded as a theorem-proving task. To construct a program whose output satisfies the conditions of the specification, we prove a theorem stating the existence of such an output. The proof is restricted to be sufficiently constructive so that a program computing the desired output can be extracted directly from the proof. The program we obtain is applicative and may consist of several mutually recursive procedures. The proof constitutes a demonstration of the correctness of this program. To exhibit the full power of the deductive approach, we apply it to a nontrivial example -- the synthesis of a unification algorithm. Unification is the process of finding a common instance of two expressions. Algorithms to perform unification have been central to many theorem-proving systems and some programming-language processors. The task of deriving a unification algorithm automatically is beyond the power of existing program-synthesis systems. In this paper, we use the deductive approach to derive an algorithm from a simple, high-level specification of the unification task. We will identify some of the capabilities required of a theorem-proving system to perform this derivation automatically. (Author)

AD-A107 331/1 PC **A02**/MF **A01**
Clarkson Coll. of Technology, Potsdam, NY.
Proton Upsets in LSI Memories in Space,
P. J. McNulty, R. C. Wyatt, G. E. Farrell, R. C. Filz, and P. L. Rothwell. 1980, 24p AFGL-TR-81-0315
Contract F30602-78-C-0102, Grant NSG-9059
Pub. in Space Systems and Their Interactions with Earth's Space Environment, v71 p413-433 1980.

No abstract available.

AD-A107 449/1 PC **A02**/MF **A01**
Office of Naval Research, London (England).
Third National Reliability Conference Birmingham, England.
Conference rept.,
M. B. Kline. 1 Sep 81, 11p Rept no. ONRL-C-8-81

This conference on the subject of reliability covered a broad range of topics, from the many aspects of reliability management to considerations of hardware, software, and the human factors involved.

AD-A107 462/4 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.
A Distributed Algorithm for Minimum Weight Directed Spanning Trees.
Technical rept.,
Pierre A. Humblet. Sep 81, 22p Rept no. LIDS-P-1149
Contract N00014-75-C-1183, ARPA Order-3045
Sponsored in Part by Grant NSF-ECS79-19880.

A distributed algorithm is presented to construct minimum weight directed spanning trees (arborescences), each with a distinct root node, in a strongly connected directed graph. A processor exists at each node. Given the weights and origins of the edges incoming to its node, a processor follows the algorithm and exchanges messages with its neighbors until all arborescences are constructed. The amount of information exchanged and the time to completion are O(Absolute value of N squared).

AD-A107 463/2 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Artificial Intelligence Lab.
The Connection Machine (Computer Architecture for the New Wave).
Memorandum rept.,
W. Daniel Hillis. Sep 81, 30p Rept no. AI-M-646
Contract N00014-80-C-0505

This paper describes the connection memory, a machine for concurrently manipulating knowledge stored in semantic networks. We need the connection memory because conventional serial computers cannot move through such networks fast enough. The connection memory sidesteps the problem by providing processing power proportional to the size of the network. Each node and link in the network has its own simple processor. These connect to form a uniform locally-connected network of perhaps a million processor/memory cells. (Author)

AD-A107 479/8 PC **A03**/MF **A01**
Defence Research Establishment Valcartier (Quebec).
Image Segmentation with Color and Texture,
J. F. Boulter. Apr 81, 37p Rept no. DREV-R-4198/81

We examined how objects or regions in an image formed by the reflection of radiation from a scene can be segmented using differences in their color and texture. The color features (normalized red content and normalized blue content) permit good spatial resolution of the segmented regions, whereas the textural features (isotropic and linear textures) help to distinguish similarly colored objects. The color and texture features were chosen because of their low dependence on viewing conditions, such as surface orientation and illumination. As an example, we segment an olive-drab colored military truck from its background of vegetation.

AD-A107 529/0 PC **A05**/MF **A01**
HRB-Singer, Inc., State College, PA.
Design and Utilization of an Infrared Data Base for an Advanced Image Interpretation Facility.
Final rept.,
Robert T. Root, Thomas E. Ray, Albert E. Brahosky, and Marshall A. Narva. Aug 80, 82p ARI-RN-80-25
Contract DA-49-092-ARO-158

A reference information data base for use in an advanced image interpretation facility was designed. The data base utilized three types of organization. Two types of organization utilized primarily representative infrared imagery examples. One type presented views of several targets under one set of acquisition parameters, while the second type presented views of one target type under all of the acquisition conditions. The third type of organization utilized primarily textual information. An indexing scheme and retrieval methodology were devised. The experimental data base, with associated software, was utilized to subject developed concepts to empirical test. One test was designed to ascertain if structured exposure to the data base would increase interpreter proficiency while another test was designed to study the efficiency of such a data base as an aid during interpretation. It was found that the request formats used on the CRT computer interface could be efficiently utilized with little training. The information presented on the slides in the data base could be easily utilized for training and as reference keys. Structured exposure to the data base in training sessions served to increase the participants' proficiency in identification, at the category level. However, no difference were found in performance between the two organizations of the imagery in the data base.

AD-A107 533/2 PC **A07**/MF **A01**
Bolt Beranek and Newman, Inc., Cambridge, MA.
The Impact of Multiprocessor Technology on High-Level Language Design.
Final rept. May 78-Sep 79,
Arthur Evans, Jr., C. Robert Morgan, Eric S. Roberts, and Edmund M. Clarke. 10 Sep 79, 147p Rept no. BBN-4188
Contract DCA100-78-C-0028

As the cost of processor hardware declines, multiprocessor architecture become increasingly cost-effective and represent an important and attractive area for future research. In order to exploit the full potential of multiprocessors, however, it is necessary to understand how to design software which can make effective use of the available parallelism. This report examines the software environments of several existing multiprocessor systems and assesses the impact of multiprocessor architecture on the design of high-level languages and related software methodology. In particular, this report concentrates on an evaluation of the programming language Ada as a potential high-order language for real-time multiprocessor systems. We conclude that Ada does not, as currently designed, meet the needs for real-time embedded systems.

LA-8078-MS PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Performance Evaluation of Linear Algebra Software in Parallel Architectures.
T. L. Jordan. Oct 79, 30p
Contract W-7405-ENG-36

Performance data of parallel computers on several of the problems of linear algebra using direct methods are provided. The computers considered include software pipeline, hardware pipeline, single-instruction multiple-data, and multiple-instruction multiple-data. Special features of each architecture are considered. Factors such as start-up time, scalar-vector break-even points, consistency in operation count, parallel steps required, and speed-up and efficiency of the hardware are discussed. A reasonably broad comparison is given for LU factorization without pivoting. A less extensive comparison is given for LU factorization with pivoting. Also various intracomputer comparisons are presented to show the performance of different implementations of a particcular algorithm as well as the performance of different algorithms for solving the same problem. Data were collected for the linear algebraic problems of matrix multiplication, regular sparse systems (including tridiagonal systems and dissection techniques), and random sparse systems. The eigenvalue problem is not addressed. 15 figures, 7 tables. (ERA citation 05:007983)

LA-8435-MS PC **A05**/MF **A01**
Los Alamos Scientific Lab., NM.
MBD Diagnostics.
W. K. Dawson. Jul 80, 84p
Contract W-7405-ENG-36

A series of tests for the BiRa Microprogrammed Branch Driver has been written and assembled into a coherent system. Detailed and understandable error diagnostics are given by each test. Experience to date indicates that an MBD that passes all tests in the system will operate reliably. An appendix gives details of engineering change orders devised to cure problems revealed by the tests. 6 figures. (ERA citation 05:033159)

LBL-10189/1 PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
BKY Programming Systems Bulletin No. 1. Guidelines for Converting FTN4 Programs to FTN5 and the New FORTRAN-77 Standard. First Edition.
R. Friedman. Aug 79, 27p
Contract W-7405-ENG-48

CONTROL DATA will be releasing their FORTRAN 77 compiler, FTN5, by September 1979. It is anticipated that FTN5 will be made available on the BKY 7600 system by mid-1980. This Bulletin is based on technical material prepared by CONTROL DATA detailing those FORTRAN language features that are changing as a result of the new FORTRAN-77 standard and their implementation of the FTN5 compiler. Suggestions to minimize conversion problems are offered here, as well as stragegies to make programs FTN4/FTN5 compatible. Actions taken by the FTN4 to FTN5 conversion program F45 are described in each instance. (ERA citation 05:034447)

LBL-10811 PC **A06**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
NRCC Software Catalog. Volume 1.
Feb 80, 108p
Contract W-7405-ENG-48

The software library is organized into the principal scientific program areas of graphics, chemical kinetics, macromolecular science, numerical methods, physical organic chemistry, quantum chemistry, statistical mechanics, and crystallography. The text part of each catalog entry consists of a brief summary of the purpose, method and other attributes of the program. Further information is provided in the full program write-up. Literature references are given in some instances. The names of the authors, and in some cases place of origin of the program are given. Most of the programs coming from outside have undergone some modification for use on the CDC7600 and therefore the NRCC takes partial responsibility for maintaining them. Difficulties encountered in using programs should be brought to the attention of NRCC staff, not the original authors. A list of available files follows the program origin. The machine designators CDC, IBM, VAX have been added to distinguish the several machine specific source versions that exist for various programs. Note that all files are in either source (card image) or printed output (line image) format. The NRCC does not distribute object or CDC Update files. The support level and distribution status are indicated for each program using the classification code described earlier. (ERA citation 05:031448)

N81-29501/6 PC **A02**/MF **A01**
Lockheed Engineering and Management Services Co., Inc., Houston, TX.
Conversion of Spu-Universal Disk File to Jsc-Universal Tape Storage: Convrt User's Guide.
W. E. Ryland. Sep 80, 12p E81-10185, NASA-CR-160938
Contracts NAS9-15800, PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of Interior, and Agency for International Development.
Erts.

The CONVRT, program which runs on a DEC PDP 11/70 computer, reads data files on disk in the SPU-Universal format and reformats the data to JSC Universal and output on tape.

N81-29509/9 PC **A02**/MF **A01**
Lockheed Engineering and Management Services Co., Inc., Houston, TX.
Computer Program Documentation User Information for the Rso-Tape Print Program (Rsoprnt).
P. M. Gibbs. Nov 80, 11p E81-10198, NASA-CR-161000
Contract NAS9-15800
Erts.

A user's guide for the RSOPRNT, a TRASYS Master Restart Output Tape (RSO) reader is presented. Background information and sample runstreams, as well as, references, input requirements and options, are included.

N82-11103/0 PC **A07**/MF **A01**
Computer Sciences Corp., El Segundo, CA.
Magnetic Field Satellite (MAGSAT) Data Processing System Specifications.
D. Berman, R. Gomez, and A. Miller. Oct 80, 136p NASA-CR-166737, CSC/TM-80/6214
Contract NAS5-24391

The software specifications for the MAGSAT data processing system (MDPS) are presented. The MDPS is divided functionally into preprocessing of primary input data, data management, chronicle processing, and postprocessing. Data organization and validity, and checks of spacecraft and instrumentation are dicussed. Output products of the MDPS, including various plots and data tapes, are described. Formats for important tapes are presented. Dicussions and mathematical formulations for coordinate transformations and field model coefficients are included.

N82-11800/1 PC **A02**/MF **A01**
Research and Data Systems, Inc., Lanham, MD.
Thermal Algorithms Analysis.
Final Report.
T. Lien. May 81, 10p NASA-CR-166716
Contract NAS5-25786

The programming and analysis methods to support the development of a thermal model of the Earth's surface from detailed analysis of day/night registered data sets from the Heat Capacity Mapping Mission satellite are briefly described.

N82-11801/9 PC **A05**/MF **A01**
Goodyear Aerospace Corp., Akron, OH.
SAR Processing on the MPP.
Final Report, 9 Jan. - 31 Aug. 1981.
K. E. Batcher, E. E. Eddey, R. O. Faiss, and P. A. Gilmore. Aug 81, 88p NASA-CR-166726, GER-17020
Contract NAS5-26430

The processing of synthetic aperture radar (SAR) signals using the massively parallel processor (MPP) is discussed. The fast Fourier transform convolution procedures employed in the algorithms are described. The MPP architecture comprises an array unit (ARU) which processes arrays of data; an array control unit which controls the operation of the ARU and performs scalar arithmetic; a program and data management unit which controls the flow of data; and a unique staging memory (SM) which buffers and permutes data. The ARU contains a 128 by 128 array of bit-serial processing elements (PE). Two-by-four surarrays of PE's are packaged in a custom VLSI HCMOS chip. The staging memory is a large multidimensional-access memory which buffers and permutes data flowing with the system. Efficient SAR processing is achieved via ARU communication paths and SM data manipulation. Real time processing capability can be realized via a multiple ARU, multiple SM configuration.

N82-11817/5 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Comparisons of Some Large Scientific Computers.
K. R. Credeur. Oct 81, 38p NASA-TM-81928

In 1975, the National Aeronautics and Space Administration (NASA) began studies to assess the technical and economic feasibility of developing a computer having sustained computational speed of one billion floating point operations per second and a working memory of at least 240 million words. Such a powerful computer woild allow computational aerodynamics to play a major role in aeronautical design and advanced fluid dynamics research. Based on favorable results from these studies, NASA proceeded with developmental plans. The computer was named the Numerical Aerodynamic Simulator (NAS). To help insure that the estimated cost, schedule, and technical scope were realistic, a brief study was made of past large scientific computers. Large discrepancies between inception and operation in scope, cost, or schedule were studied so that they could be minimized with NASA's proposed new compter. The main computers studied were the ILLIAC IV, STAR 100, Parallel Element Processor Ensemble (PEPE), and Shuttle Mission Simulator (SMS) computer. Comparison data on memory and speed were also obtained on the IBM 650, 704, 7090, 360-50, 360-67, 360-91, and 370-195; the CDC 6400, 6600, 7600, CYBER 203, and CYBER 205; CRAY 1; and the Advanced Scientific Computer (ASC). A few lessons learned conclude the report.

PB82-121740 CP **T14**
Johns Hopkins Univ., Laurel, MD. Applied Physics Lab.
INFO: The JHU/APL Information Package.
Software,
Gordon Trotter. 5 Jan 81, mag tape FSWEC-77/0368
Source tape is in EBCDIC character set and certain fields contain packed decimal data. Character set restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-121757.

This is a collection of computer programs, file organization conventions, and programming aids for processing files of textual data. Usual applications are report printing, information retrieval or a combination of the two. Programs include: Edit to create and maintain standard files; Print to print standard files in a variety of camera-ready and other formats; Indexr to produce subject or keyword indexes; Process to select and/or transform records of a file according to specified criteria; Refer to renumber sections of a file and update cross references; Invf to invert a descriptorized file: Isort to sort a standard file; Prompt to provide interactive data entry with prompting...Software Description: The system is written in the PL/1 and ALC programming languages for implementation on an IBM 370 or 3033 computer using the OS/VS2 operating system. The computer memory requirement is 300K bytes.

PB82-121757 PC **A23**/MF **A01**
Johns Hopkins Univ., Laurel, MD. Applied Physics Lab.
INFO: The JHU/APL Information Package Manual.
Final rept.,
Robert P. Rich, and Gordon T. Trotter. 5 Jan 81, 526p BCO-81-1, FSWEC-77/0368-1
Contract N00024-78-C-5384
For system on magnetic tape, see PB82-121740.

INFO is a collection of computer programs, file organization conventions and programming aids for processing files of textual data. Usual applications are document printing, information retrieval, or a combination of the two. Programs include: EDIT to create and maintain standard files; PRINT to print standard files in a variety of camera-ready and other formats: INDEXR to produce subject or keyword indexes; PROCESS to select and/or transform records of a file according to specified criteria; REFER to renumber sections of a file and update cross references; INVF to invert a descriptorized file; ISORT to sort a standard file; PROMPT to provide interactive data entry with prompting.

PB82-121765 CP **T03**
Internal Revenue Service, Washington, DC. Programming Standards Branch.
Patch Macro and Load Module (IRSPATCH).
Software,
Arnold Mailinger. 13 Aug 76, mag tape FSWEC-79/0003
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Irspatch provides assembler language programs with the capability to dynamically modify the program at execution time. The routines process patch data from a patch data set provided by the user, converting the data into pseudotest that replaces load module text already in memory. Irspatch is an assembler language macro which links to the actual patch routine; the patches are read from a card input data set and a patch listing is created on a Sysout data set...Software Description: The module is written in the ALC programming language for implementation on an IBM S/370-168 computer using the OS or MVS operating system. The computer memory requirement is 1000(HEX).

PB82-121773 CP **T14**
Naval Air Station, San Diego, CA. Management Systems Development Office.
COBOL Analysis and Translate System (CATS).
Software.
1 Apr 77, mag tape FSWEC-81/0041

Source tape is in ASCII character set. Character set restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-121781.

Cats is a Cobol-to-Cobol analyzer/translator originally developed for use on the B3500/4700 computers at the project sites. Specifically designed grammar tables for the Cobol compilers in use at the time (RCA 3301, RCA 70/45, IBM 360 series, B3500/4700 and Honeywell 1800) were included in the Cats software to provide a capability to analyze and translate Cobol programs targeted for conversion. The structure of Cats allows for the following functions: (1) Analyze and Upgrade. Analyze Cobol source code to determine conformance with American National Standards Institute Cobol. During the analysis, Cats explores possible logic paths which may be taken at run time and uses this information to delete unreachable (dead) code via a REMOVE DEAD option and to identify potential translation problems caused by different implementations of the PERFORM statement. The upgrade function automatically modifies the source program to convert non-Ansi statements to Ansi statements where equivalency exists. (2) Translate. This function automatically translates upgraded Ansi statements written for the source computer to Ansi statements for the target computer. (3) Single Source Maintenance. This function, in conjunction with the translate function, permits development and maintenance of source programs on a single computer in an environment where several makes/models of hardware are in use. For example, programs may be developed and maintained on the B3500/4700 for execution on any of several other target computers. (Source code produced by this means must be recompiled on the target computer before use.) Primary use of Cats is to precondition programs prior to conversion...Software Description: The system is written in the COBOL programming language for implementation on a Burroughs 3500 computer using the MCP operating system. The computer memory requirement is 80K bytes.

PB82-121781 PC **A12**/MF **A01**
Naval Air Station, San Diego, CA. Management Systems Development Office.
COBOL Analysis and Translate System (CATS). Technical Note.
Dec 75, 264p MSDO-M-011-TN-02B, FSWEC-81-0041-1
For system on magnetic tape, see PB82-121773.

CATS is a COBOL-to-COBOL analyzer/translator originally developed for use on the B3500/4700 computers at the project sites. Specifically designed grammar tables for the COBOL compilers in use at the time (RCA 3301, 70/45, IBM 360 series, B3500/4700 and Honeywell 1800) were included in the CATS software to provide a capability to analyze and translate COBOL programs targeted for conversion. The structure of CATS allows for the following functions: (1) Analyze and upgrade; (2) Translate; (3) Single source maintenance. Primary use of CATS is to pre-condition programs prior to conversion.

PB82-121856 CP **T03**
Veterans Administration, Austin, TX. Data Processing Center.
CLMTIC3 - Tally Incidence of Characters.
Software,
Loren Overbo. 11 Sep 78, 1p FSWEC-80/0047
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Clmtic3 is a program which counts and displays the frequency of occurrence of characters in selected positions of the input records. The parm field permits designation of the following variables: (a) One to 15 positions of the input file; (b) One of three tallied character sets ((alphanumerics and other), (alphanumerics, special characters, and other), (all 256 hexadecimal bytes)); (c) Number of records to skip; (d) Sampling internal and (e) Number of records to tally. Its uses include the following: (a) Analyzing files for potential random access keys; (b) Identifying and locating illegal characters in a file; (c) Counting one byte key types...Software Description: The program is written in the ALC programming language for implementation on an IBM 360/65-370 computer using the OS MVT 21.8 operating system. The computer memory requirement is 20K.

PB82-121864 CP **T02**
Veterans Administration, Austin, TX. Data Processing Center.
COPY3 - Copy Sequential Data Sets.
Software,
Loren Overbo. 1 Aug 77, mag tape FSWEC-80/0048
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

This program makes one, two, or three copies (or none at all) of an input sequential data set, depending on how many Ddnames are present in the JCL. File attributes (Blksize, Lrecl, and Recfm) are copied from the input file to the output file unless specified through JCL or existing file labels. Output file and input record count messages are provided on Sysmsg. The program will process blocked or unblocked files, containing fixed, variable, or undefined records...Software Description: The program is written in the ALC programming language for implementation on an IBM 360/65 computer using the OS MVT 21.8 operating system. Computer memory requirement is 10K.

PB82-121872 Mag Tape $95.00
Transportation Systems Center, Cambridge, MA.
Plotting Routines NOMEN and CLINE.
Software,
Robert Peabody. 10 Jul 81, mag tape FSWEC-79/0105
Source tape is in EBCDIC character set and certain fields contain packed decimal data. Character set restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions.

Cline is a Fortran callable subroutine which is used to draw different types of lines connecting points ((X sub i), (Y sub i)). Five different line options are available via the calling sequence. The user must supply his own calling program. Nomen is a Fortran callable subroutine which is used to draw an inch of line type followed by a title for annotation of a plot. One of five line types can be chosen along with any explanation of what the line type represents. The user must supply his own calling program...Software Description: The subroutines are written in the Fortran IV programming language for implementation on a DEC-10 computer using the TOPS-10 operating system. The computer memory requirement is 211.

PB82-121880 CP **T05**
Department of Housing and Urban Development, Washington, DC. Office of ADP Systems Development.
COBOL Structured Code Analyzer.
Software,
Dale Brenneman. 1 Jun 80, mag tape FSWEC-80/0118
Source tape is in ASCII character set. Character set restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions.

Monitoring the use of structured programming by manual inspection of the Cobol source code is a time-consuming process. The Structured Code Analyzer will automatically detect and pinpoint occurrences of unstructured Cobol code by a static analysis of the source code. The input is a Cobol source program which was compiled with no errors. The output is a report containing two sections. The first is a listing of the Cobol source code which was analyzed, with a comment denoting the type of unstructured code printed to the right of the corresponding source code line where the type was found. The second section is a summary page, giving the total number of occurrences of each type of unstructured code found...Software Description: The program is written in the COBOL and ASM programming languages for implementation on a UNIVAC 1108/1180 computer using the EXEC, levels 33R3 and 36R2, operating system. The computer memory requirement is 16K words.

PB82-121930 CP **T05**
Naval Air Station, San Diego, CA. Management Systems Development Office.
COBOL Audit and Debugging Aid (CADA INSERT).
Software.
1 Apr 77, mag tape FSWEC-81/0040
Source tape is in ASCII character set. Character set restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-121948.

This program inserts coding to Cobol programs which captures statistics about Cobol data path occurrences, down to the statement level. A detailed audit report is generated by the instrumented program to assist in testing, or test data evaluation...Software Description: The program is written in the COBOL programming language for implementation on a UNIVAC 1100 or Burroughs 3500 computer using the EXEC-8 operating system. The computer memory requirement is 40KB.

PB82-121948 PC **A04**/MF **A01**
Naval Air Station, San Diego, CA. Management Systems Development Office.
COBOL Audit and Debugging Aid (CADA INSERT). Technical Note.
Jul 76, 60p MSDO-M-011-TN-08A, FSWEC-81/0040-1
For system on magnetic tape, see PB82-121930.

The COBOL Audit and Debugging Aid (CADA INSERT) provides a means of evaluating test data for system development, conversion and program maintenance. It inserts coding to COBOL programs and identifies the logic paths within a program which have and have not been executed by the test data. Statistical information is provided in the form of two reports, the Detailed CADA Report and the CADA Summary Report. The information is useful in determining if further program testing is necessary according to accepted standards.

PB82-127267 PC **A08**/MF **A01**
National Institutes of Health, Bethesda, MD. Div. of Computer Research and Technology.
Project RMAG: SLANG (Structured Language) Compiler,
Robert A. Magnuson. Jan 80, 152p NIH-DCRT-DMB-SSS-UG105, NIH/DF-79/006B
Supersedes PB80-117559. For system on magnetic tape, see PB-294 144.

Sporting its new name, this is the long-promised 'RMAGASM in RMAGASM'. Designed to assist programmers writing powerful structured programs, the SLANG Compiler generates block-structured IBM 370 assembly language source code. Based on some six years experience developing and using the RMAG-implemented RMAGASM compiler, SLANG retains the important features of its predecessor while adding some original, new ones of its own. For example, SLANG's extension to the IF block permits the choice of n segments, while retaining--as a subset--the familiar two-segment choice. The new embellished SYSPRINT and STRUCTUR output datasets are potent tools used for the development and documentation of programs. SLANG has its own macro facility--available during its operation--enabling the user to easily create long or complex sequences of SLANG commands and structures. Useful macros can be created, tested, and saved independently. These macros can be made available to SLANG by the MACLIB command which references external libraries by Ddname. Macro definitions can also be included directly within SLANG source programs.

PB82-133521 PC **A05**/MF **A01**
SoHaR, Inc., Los Angeles, CA.
Synopsis of Interviews from a Survey of Software Tool Usage,
Herbert Hecht. Nov 81, 81p NBSIR-81-2388
Contract NB79-SBCA-0273

This report contains synopses of all interviews conducted as part of a survey of the development and use of software tools in industry and Government and a classification of the tools encountered. The purpose of the report is to document the detailed data in a form which may be helpful for further research.

PB82-134412 PC **E03**/MF **A01**
Federal Compiler Testing Center, Falls Church, VA.
Harris Corporation, Harris 1600-02 Model II, Harris Interactive COBOL, Version 107.1 (Validation).
Validation summary rept.
21 Aug 81, 57p FCTC-81-104

This Validation Summary Report (VSR) for the Harris Interactive COBOL Compiler Version 107.1 (ECOS Version 106.1) provides a consolidated summary of the results obtained from the validation of the subject compiler against the 1974 COBOL Standard (X3.23-

1974/FIPS PUB 21-1). The compiler was validated at the Low-Intermediate level of FIPS PUB 21-1. The VSR is made up of several sections showing the discrepancies found. These include an overview of the validation which lists all categories of discrepancies by level/module within X3.23-1974, a section relating the categories of discrepancies to each of the Federal levels of the language; and a detailed listing of discrepancies together with the tests which were failed.

PB82-134735 PC **A07**/MF **A01**
Electronic Industries Association, Washington, DC.
Standardization in Microcomputer/LSI Products Via Electronic Information Exchange: JEDEC/EIES Project.
Final rept. 1 Sep 78-30 Jun 80,
Peter Johnson-Lenz, and Trudy Johnson-Lenz. 30 Jun 80, 145p
Grant NSF-DSI78-09189

From September, 1978 through April, 1980, members of JEDEC (Joint Electron Device Engineering Council) committees and task groups experimented with using electronic information exchange in their standards development work. Under the aegis of the Electronic Industries Association (EIA), JEDEC is an association of firms concerned with the manufacture of solid state electronic components. Based on participant perceptions before and after the project and statistics about use of EIES (the Electronic Information Exchange System used as a test facility), the project had a generally positive outcome. EIES use affected JEDEC work by speeding the process, contributing to better decisions with more information available and more discussion, and by creating better continuity between meetings and a sense that participants went to meetings better prepared. Many other factors affecting use and impacts on JEDEC work were also investigated. Although electronic information exchange cannot be used as the primary communications medium for committees developing standards because of legal concerns and the cost of terminals, it does seem very useful for committee work between meetings and for specific task group work.

PB82-134743 PC **A04**/MF **A01**
SoHaR, Inc., Los Angeles, CA.
Computer Science and Technology: A Survey of Software Tools Usage.
Final rept.,
Herbert Hecht. Nov 81, 61p NBS/SP-500-82
Library of Congress catalog card no. 81-600112.

The state of the art regarding the development and use of software tools is presented. The information was gathered from an in-depth survey of 23 sites with Government and industry. A comparison is made among the levels of tool usage based on the size and type of programming group. The survey examines aspects that both promote or inhibit tool usage and provide requirements for the future.

PB82-134776 PC **A02**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
On-Lining an SDK-85 Microcomputer with a DEC System 10 for Down-Line Loading of Microcomputer Programs,
V. L. B. de Freitas. Jun 79, 19p CONTROL SYSTEMS CENTRE-457

This report outlines a simple method of on-lining an INTEL SDK-85 microcomputer to a DEC System 10 for the purpose of down-line loading programs developed in the large machine. The protocol software is described and the use of the link is illustrated with two examples.

PB82-135146 CP **T02**
National Bureau of Standards, Washington, DC. Inst. for Computer Sciences and Technology.
Codes for Named Populated Places, Primary County Divisions, and Other Locational Entities of the United States (Fourth Update); FIPS PUB-55.
Data file,
Henry Tom. 1 Dec 81, mag tape NBS/DF-81/006
Supersedes PB81-171266.
Source tape is in ASCII or EBCDIC character set. Character set restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions.

The files of the fourth update provide a unique code for each listed populated place, primary county division, and other locational entity. The tape now includes outlying areas. Additional data added to this update concern incorporated places, census designated places, Indian reservations, and Alaskan native villages. For incorporated and census designated places, the Master Reference File (MRF) numbers assigned by the U. S. Bureau of the Census have been added. Identification numbers assigned by the same agency have been added for Indian reservations and Alaskan native villages. Identification numbers of all Congressional Districts (CD's) in which these places, reservations, and villages are located have been added also. If any of these entities are located in a Standard Metropolitan Statistical Area (SMSA), that information is recorded. Four indexing fields are used on the tape, but are not printed in the hard copy version.

PB82-135633 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
Design Concepts for a Hierarchical Two Dimensional Multiprocessor Structure,
D. Aldabass. Mar 79, 35p CONTROL SYSTEMS CENTRE-439

Consideration is given to the partitioning of the Instruction and Data streams of a conventional von Neuman program. A 2D array of processors is formulated which operates under a different parallel processing mode in each dimension. Two types of 2D concurrency are identified: one at the instruction level, and the other at the program level. Concepts for a 2D hierarchy are developed and imposed on the structure to aid control. Some aspects of hardware design are discussed.

PB82-135658 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
SYCOL: Informal Language Specification,
S. J. Young. Feb 79, 50p CONTROL SYSTEMS CENTRE-448

This report defines a proposed new language called SYCOL (Systems and Control Orientated Language) which has been designed specifically for applications in real time control. Syntax is given in an extended BNF notation and semantics are presented informally through English description and examples.

PB82-135666 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
SYCOL: A High Level Language for Applications in Real Time Control Systems,
S. J. Young. Feb 79, 28p CONTROL SYSTEMS CENTRE-449

The rapid advance of microprocessor technology is creating many new application areas for real time computer control techniques. Advanced methods such as multivariable and adaptive control are now becoming economically feasible using low cost microprocessor hardware. However, development in this area is being severely hindered by the lack of good software tools and in particular by the lack of suitable high level languages. This report outlines the main features of a new high level programming language specifically designed for the real time control applications area. The language called SYCOL (Systems and Control Oriented Language) is based upon the experimental language MODULA but includes additional facilities to meet the specific needs of computer control systems.

PB82-136219 PC **E02**/MF **E02**
Radcliffe Science Library (England).
The Use of Applicative Programming in Data Processing.
Progress rept.,
C. Kalus. Jul 79, 19p RSL/ENG-673/2
Portions of this document are not fully legible.

The purpose of this project is to investigate the use of applicative programming languages in Data Processing. One advantage of applicative languages is that their semantics tend to be simple, this in turn can simplify the task of verifying programs written in such languages. The author wishes to investigate whether it is currently practicable to applicatively program data processing problems and to completely verify these programs. If this is feasible, it will result in a much higher level of confidence in the programs than is otherwise possible.

PB82-136474 PC **A14**/MF **A01**
National Bureau of Standards, Washington, DC.
Test Problems and Results for OMNITAB 80.
Final rept.,
Sally T. Peavy, and Shirley G. Bremer. Nov 81, 320p NBS-TN-1147
See also report for Dec 70, COM-71-50076. Supersedes COM-71-50609.

The lack of test problems and results for many computer software packages is a great hindrance to both the systems programmer and the general user. In this publication a set of 69 test problems and results for the OMNITAB 80 system is provided to assist individuals in checking the installation of the OMNITAB 80 system on their particul ar computer. The general user will also find these descriptive examples instructive in the use of the OMNITAB 80 system.

PB82-136748 PC **A07**/MF **A01**
Computer Corp. of America, Cambridge, MA.
Evaluation Criteria for a CODASYL Query Language.
Interim rept.,
Frank Manola, John Smith, and Diane Smith. 10 Mar 80, 150p CCA-80-17, NBS-GCR-81-337
Contract NB79-SBCA-0088
See also PB82-136755.
Also available in set of 3 reports PC E16, PB82-136730.

This report describes evaluation criteria which will be used in the development by CCA of a query Language for CODASYL-type data structures. The evaluation criteria will be the basis for a specific set of capabilities to be provided by the query language. The capabilities to be provided are determined by choosing, for each evaluation criterion, a position describing a specific level of capability. The evaluation criteria are also useful in the evaluation of existing query languages. In addition to a discussion of the evaluation criteria and positions, the report includes a description of those database users for which a query language based on the proposed evaluation criteria is intended. The report also discusses related language facilities which might appear in the context of such a query language.

PB82-136755 PC **A07**/MF **A01**
Computer Corp. of America, Cambridge, MA.
Capabilities for a CODASYL Query Language.
Interim rept.,
Frank Manola. 10 Jun 80, 126p CCA-80-18, NBS-GCR-81-338
Contract NB79-SBCA-0088
See also PB82-136748, and PB82-136763.
Also available in set of 3 reports PC E16, PB82-136730.

This report describes proposed capabilities which are to be provided in a query language being designed by CCA which will operate on CODASYL-type database structures. In order to define the nature of these capabilities in a way sufficiently detailed to be the basis of language design, the capabilities are illustrated by examples using two prototype languages. These languages, while not complete, are currently under investigation. The languages are SNEQUEL, based on IBM's relational query language SQL, and CODAPLEX, based on Shipman's functional language DAPLEX. Proposed capabilities include those necessary for querying relational, as well as CODASYL, databases.

PB82-136763 PC **A10**/MF **A01**
Computer Corp. of America, Cambridge, MA.
A Survey of CODASYL Query Languages.
Interim rept.,
Frank Manola, and Jane Barnett. 22 Sep 80, 223p CCA-80-19, NBS-GCR-81-339
Contract NB79-SBCA-0088
See also PB82-136755.
Also available in set of 3 reports PC E16, PB82-136730.

This report describes capabilities provided by query languages designed for use with CODASYL-type database management systems. The languages surveyed include both commercially-available products and query languages which have been described in the research literature. The report first discusses criteria used to evaluate the various query languages studied, as well as capabilities which were considered of special interest in the study. The report then presents a separate section on each query language surveyed. The capabilities of each language are described with respect to the specified evaluation criteria, and a list of references for each language is provided.

PB82-136953 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
Simulation of a Two-Dimensional Multiprocessor Structure,
D. Al-Dabass. Jan 79, 47p CONTROL SYSTEMS CENTRE-446
Portions of this document are not fully legible.

The interconnection scheme for a parallel processing structure designed in an earlier report is simulated at the machine state level using Fortran. A special set of indices is devised to carry out the 2D propogation of signals among all processors in a methodical fashion to guarantee correctness of simulation. Various sections of the Bus subroutine are described; and the simulation of the special-instructions microprogram performed by the Processor subroutine is outlined. Test programs to verify the hardware design and simulation methodology are detailed.

PB82-138181 PC **A06**/MF **A01**
Little (Arthur D.), Inc., Cambridge, MA.
The Effects of Future Information Processing Technology on the Federal Government ADP Situation.
Sep 81, 106p NBS-GCR-81-342
Prepared in cooperation with General Systems Group, Inc., Salem, NH., and Aurora Associates, Inc.

This report qualitatively forecasts the effects on the Federal ADP inventory of new and expected automated data processing technology, shifts in industry structure, and proposed changes in Federal ADP regulations. The report includes both forecasts jointly prepared by Arthur D. Little, Inc. and General Systems Group, Inc. and comments by ICST staff. Major sections of the document cover underlying technologies, changes in the information industry and market, future products and systems, the present Federal ADP situation, and proposed policy changes.

PB82-802398 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
The Use of Computers in Solving Mathematical Problems. 1976-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1976-Nov 81.
Dec 81, 147p
Supersedes PB80-813298, and NTIS/PS-79/0798. See also 1971-75, NTIS/PS-78/0781.

Reports are cited on the computer solution of algebraic and differential equations. The necessary software and hardware for implementation, as well as solutions to large sparse matrices, stiff differential equations, and statistical problems, are included. Some of the research is directly applicable to various physical sciences. (This updated bibliography contains 141 citations, 18 of which are new entries to the previous edition.)

PB82-802406 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Microcomputers: Basic Design and Development. July, 1979-September, 1980 (Citations from the Engineering Index Data Base).
Rept. for Jul 79-Sep 80.
Dec 81, 321p

The bibliography of worldwide research literature cites studies on the design and development of microcomputers. Studies on software development, chip development, LSI technology, and reliability and performance evaluation testing are included. (This updated bibliography contains 316 citations, 133 of which are new entries to the previous edition.)

PB82-802414 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Microcomputers: Basic Design and Development. October, 1980-November, 1981 (Citations from the Engineering Index Data Base).
Rept. for Oct 80-Nov 81.
Dec 81, 247p
Supersedes PB80-812654, and NTIS/PS-79/0730.

The bibliography of worldwide research literature cites studies on the design and development of microcomputers. Studies on software development, chip development, LSI technology, and reliability and performance evaluation testing are included. (This updated bibliography contains 242 citations, all of which are new entries to the previous edition.)

PB82-802810 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Microcomputers: Design and Software Development. 1979-November, 1981 (Citations from the NTIS Data Base).
Dec 81, 169p
Supersedes PB80-812621, and NTIS/PS-79/0723.

The design of microcomputers and the development of its software are covered in this bibliography of Federally-funded research. Studies on microcomputer applications are included only if the above topics are cited. Circuit and chip technology, reliability, and performance evaluation are included. (This updated bibliography contains 161 citations, 78 of which are new entries to the previous edition.)

PB82-802919 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Networks. August, 1979-November, 1981 (Citations from the NTIS Data Base).
Dec 81, 270p
Supersedes PB80-814015, and NTIS/PS-79/0879.

The bibliography cites research reports on aspects of computer networks, including hardware, software, data transmission, time sharing, and applicable theory to network design. Specific studies on the ARPA network, the OCTOPUS network, the TENEX system, distributed networks, and other such systems are cited. (This updated bibliography contains 262 citations, 128 of which are new entries.)

PB82-803529 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Microcomputers: Telecommunication Applications. July, 1979-June, 1980 (Citations from the Engineering Index Data Base).
Jan 82, 196p

The bibliography of worldwide research literature cites studies on telecommunication applications of microcomputers. Telephone, data transmission, teleprinters, facsimile communication, and communications controllers are among the applications cited. (This updated bibliography contains 191 abstracts, none of which are new entries to the previous edition.)

PB82-803537 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Microcomputers: Telecommunication Applications. July, 1980-October, 1981 (Citations from the Engineering Index Data Base).
Jan 82, 277p
Supersedes PB80-812696, and NTIS/PS-79/0728. See also NTIS/PS-76/0203, NTIS/PS-77/0326, and PB80-812688.

The bibliography of worldwide research literature cites studies on telecommunication applications of microcomputers. Telephone, data transmission, teleprinters, facsimile communication, and communications controllers are among the applications cited. (This updated bibliography contains 272 citations, all of which are new entries to the previous edition.)

PB82-859372 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Metatheory for Sequencing and Database Management. 1972-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 72-Dec 81.
Dec 81, 146p

This bibliography cites reports on that portion of computer metatheory that treats sequencing, queueing, and priority allocation for computational problems. This job flow control allows for optimal and efficient use of computer capacity and parallel processors. Some of the abstracts address time to deadlock and graceful degradation of the operating system with minimal restrictions on users. (Contains 169 citations fully indexed and including a title list.)

PB82-859380 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Metatheory for Sequencing and Database Management. 1976-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 110p

This bibliography cites reports on that portion of computer metatheory that treats sequencing, queueing, and priority allocation for computational problems. This job flow control allows for optimal and efficient use of computer capacity and parallel processors. Some of the reports address time to deadlock and graceful degradation of the operating system with minimal restrictions on users. (Contains 118 citations fully indexed and including a title list.)

9C. Electrical and Electronic Engineering

AD-A107 124/0 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
Digital Signal Processing Research.
Progress rept.,
Alan V. Oppenheim, L. J. Griffiths, J. S. Lim, A. B. Baggeroer, and J. H. McClellan. 1981, 20p
Contract N00014-75-C-0951
Pub. in RLE Progress Rept. no. 123, Section 22, p145-161 Jan 81.

No abstract available.

N82-11109/7 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
Concept for a Power System Controller for Large Space Electrical Power Systems.
L. F. Lollar, J. R. Lanier, Jr., and J. R. Graves. Nov 81, 15p NASA-TP-1939

The development of technology for a fail-operatonal power system controller (PSC) utilizing microprocessor technology for managing the distribution and power processor subsystems of a large multi-kW space electrical power system is discussed. The specific functions which must be performed by the PSC, the best microprocessor available to do the job, and the feasibility, cost savings, and applications of a PSC were determined. A limited function breadboard version of a PSC was developed to demonstrate the concept and potential cost savings.

PB82-856576 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electrohydraulic Control Systems. 1973-1981 (Citations from the BHRA Fluid Engineering Data Base).
Rept. for Jan 73-Dec 81.
Dec 81, 190p

Electrohydraulic systems are discussed in terms of their applications to automatic control devices employing servosystems. In addition, the use of these systems in industry for metal working and molding is presented. Other topics include low speed motors and hydraulic valves. (Contains 225 citations fully indexed and including a title list.)

PB82-858796 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
High Voltage Direct Current Network Modeling and Simulation. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for Jan 75-Dec 81.
Dec 81, 67p

This bibliography covers modeling and simulation of the operation and performance of high voltage direct current (HVDC) networks and links. Topics include system stabilization and control. (Contains 57 citations fully indexed and including a title list.)

PB82-859562 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Direct Current Motor Control. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for Jan 75-Dec 81.
Dec 81, 274p

Power conversion, switching, speed and position control for DC motors are discussed in this bibliography. Constant speed, constant torque, feedback circuits, and microprocessor control of small to large DC motors are included. Applications of machine and process control using DC motors are considered in the steel, automotive, and metal working industries. (Contains 283 citations fully indexed and including a title list.)

9D. Information Theory

AD-A106 905/3 PC **A02**/MF **A01**
California Univ., Los Angeles. Dept. of System Science.
The Use of Output Moments to Predict Performance of Nonlinear Systems with Gaussian Inputs.
Technical rept.,
Laurence B. Milstein. Sep 81, 7p Rept nos. UCLA-ENG-81-32, TR-20
Contract N00014-76-C-0875
Pub. in International Conference on Communications, p33.2.1-33.2.4 Jun 81.

No abstract available.

AD-A106 908/7 Not available NTIS
Stanford Univ., CA.
The Time-Sequenced Adaptive Filter,
Earl R. Ferrara, Jr., and Bernard Widrow. 25 Mar 80, 5p
Contracts N00014-76-C-0929, N00019-80-C-0483
Sponsored in part by Grant NSF-ECS78-08526.
Availability: Pub. in IEEE Transactions on Circuits and Systems, vCAS-28 n6 p519-523 Jun 81.

No abstract available.

AD-A107 123/2 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
A New Algorithm for Two-Dimensional Maximum Entropy Power Spectrum Estimation,
Jae S. Lim, and Naveed A. Malik. 6 Aug 80, 14p
Contracts N00014-75-C-0951, F19628-78-C-0002
Pub. in IEEE Transactions on Acoustics, Speech, and Signal Processing, vASSP-29 n3 p401-413 Jun 81.

No abstract available.

AD-A107 443/4 PC **A03**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Estimation of Sensor Detection Probabilities with Data from Concurrent Sensors.
Technical rept.,
Donald R. Barr. Aug 81, 29p Rept no. NPS55-81-014

When several sensors are concurrently scanning the same domain for signals, varying numbers of sensors may detect each signal. On some occasions, a signal may not be detected by any of the receivers. Using detection data collected from all the receivers over a period of scanning, it is possible to estimate the total number of signals that occurred in that period (including those that were not detected at all), as well as the detection probabilities for the individual receivers. Several estimators for these quantities are developed, in the contexts of several models concerning the signal generation process and the receiver behavior. (Author)

PB82-132804 PC **A03**/MF **A01**
Hawaii Univ. at Manoa, Honolulu. Dept. of Electrical Engineering.
Differential PCM Systems,
Ethirajan Janardhanan, and B. Kinariwala. Mar 78, 49p EE-77-CANO3, NSF/RA-780915
Grant NSF-ENG74-19788

Matched predictor differential PCM systems are analyzed for stationary first order Gauss Markov process inputs. The computational procedure yields convergent solutions for the variance and the probability density function of the point-wise error for all sampling intervals. Time average error between the input signal X(t) and a time continuous estimate are computed, and it is used as the basis for finding the optimum number of quantizer levels and hence the optimum sampling interval, for a given bit rate. For time average error values of practical interest, 4 level DPCM is superior; the time average error exceeds the appropriate rate-distortion bound by only 2.5 db. A comparison with a good PCM system shows that 4 level DPCM is superior for large bit rates and the difference increases with bit rate. The same DPCM systems are analyzed under the assumption that the prediction error is Gaussian and the results are within 10% of the exactly computed results for the region of optimum performance.

9E. Subsystems

AD-A106 909/5 Not available NTIS
Stanford Univ., CA. Information Systems Lab.
Adaptive Design of Digital Filters,
Bernard Widrow, Paul F. Titchener, and Richard P. Gooch. 1980, 3p
Contract N00014-76-C-0929, Grant NSF-ENG78-08526
Availability: Pub. in Proceedings of IEEE International Conference on Acoustics, Speech and Signal Processing, p243-245, 30-31 Mar and 1 Apr 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 019/2 Not available NTIS
California Univ., Berkeley. Dept. of Electrical Engineering and Computer Sciences.
Design Aids for VLSI: The Berkeley Perspective,
Arthur Richard Newton, Donald O. Pederson, Alberto L. Sangiovanni-Vincentelli, and Carlo H. Sequin. 1 Dec 80, 16p ARO-17660.1-EL
Contract DAAG29-81-K-0021
Availability: Pub. in IEEE Transactions on Circuits and Systems, vCAS-28 n7 p666-680 Jul 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 057/2 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
The Effect of Acoustic Dispersion and Attenuation on SAW Convolver Performance.
Journal article,
Eric L. Adler, and John H. Cafarella. 5 Nov 80, 5p MS-5434, ESD-TR-81-243
Contract F19628-80-C-0002, ARPA Order-600
Pub. in Proceedings of Ultrasonics Symposium (1980), p1-4 Nov 80.

No abstract available.

AD-A107 058/0 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Some Factors Affecting Angular Resolution in an Adaptive Antenna.
Journal article,
Bing M. Potts, Alan J. Simmons, and Joseph T. Mayhan. 14 Jun 81, 10p MS-5649, ESD-TR-81-246
Contract F19628-80-C-0002
Pub. in Proceedings of the International Conference on Communications, p10. 4.1 - 10.4.9 Jun 81.

No abstract available.

AD-A107 062/2 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
A 31-GHz Monolithic GaAs Mixer/Preamplifier Circuit for Receiver Applications.
Journal article,
Alejandro Chu, William E. Courtney, and Roger W. Sudbury. 9 Jul 80, 7p JA-5138, ESD-TR-81-261
Contract F19628-80-C-0002
Pub. in IEEE Transactions on Electron Devices, vED-28 n2 p149-154 Feb 81.

No abstract available.

AD-A107 114/1 PC **A06**/MF **A01**
Technische Univ., Munich (Germany, F.R.). Inst. fuer Hochfrequenztechnik.
Cross Correlation in a Space-Diversity System on a Military Vehicle.
Final technical rept, Jul 80-Oct 81,
Gerhard Flachenecker, and Lothar Tschimpke. Aug 81, 105p
Contract DAJA37-80-C-0347

Mobile reception in built-up areas is disturbed by interference-fading effects due to multiple incident waves caused from reflecting and scattering objects in the vicinity. The fading can be reduced with the help of space-diversity systems, i.e. with more than one antenna on the car. The fade-reduction factor or the diversity gain of such a system strongly depends on the cross correlation of the antenna-output voltages. The related correlation factor is a function of frequency, is influenced by the car's surface, and depends on the mounting locations of the antennas. If a space-diversity system shall be established, proper antenna locations on the car in mind have to be determined. This report records the results of determining the cross correlation between antennas for various antenna-mounting configurations for a US Army 1/4-ton truck, M151 A2. The antenna receiving patterns are measured for the various configurations. These signal strength measurements are converted to correlation factors of signal power by assuming a Rayleigh distribution of the multipath signal strengths. The Rayleigh distribution has been shown to accurately characterize multipath reception in the 30-80 MHz band in built-up areas. In this manner, the requirement for time-consuming test drives was eliminated, and a more thorough investigation of the cross correlation phenomena was made possible for the same resources. (Author)

AD-A107 231/3 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Performance Advantage of Complex LMS for Controlling Narrow-Band Adaptive Arrays.
Journal article,
Larry L. Horowitz, and Kenneth D. Senne. 15 Jun 80, 15p JA-5252, ESD-TR-81-270
Contract F19628-80-C-0002
Pub. in IEEE Transactions on Circuits and Systems, vCAS-28 n6 p562-576 Jun 81.

No abstract available.

AD-A107 339/4 PC **A07**/MF **A01**
Westinghouse Defense and Electronic Systems Center, Baltimore, MD.
Establishment of Production Techniques for Transducer Acoustic Delay Lines on a Pilot Line Basis.
Final rept. Sep 77-Apr 80,
A. F. Zahorchak, R. A. Moore, R. N. Sundelin, J. B. Goodell, and B. R. McAvoy. Jun 81, 128p HDL-CR-81-569-1
Contract DAAB07-77-C-0569

For about the past decade the development of microwave acoustic delay lines has seen few innovations. It is primarily for this reason that opportunities in the production of these lines leading to lower cost and improved performance was not realized. Such innovations include monolithic matching, mosaic transducers and an intensive investigation of processing steps and systems operation. All aspects of delay line design have been reexamined including media loss and anisotropy, transduction efficiency, diffraction and transducer film analysis. The net result of this effort is an essentially new approach to delay line design. This design lends itself well to batch fabrication processes with resulting cost reductions and performance improvement. (Author)

AD-A107 539/9 PC **A07**/MF **A01**
TRW Defense and Space Systems Group, Redondo Beach, CA.
Surface Acoustic Wave Microwave Oscillator and Frequency Synthesizer.
Final rept. 1 Oct 79-31 Mar 81,
D. J. Dodson, M. Y. Huang, and M. D. Brunsman. Sep 81, 132p DELET-TR-78-2992-F
Contract DAAB07-78-C-2992

This final report details the technical progress achieved on task II of the program Surface Acoustic Wave Microwave Oscillator and Frequency Synthesizer. The objective of the Task II effort ws to establish a synthesizer design which, when packaged, provided a significant reduction in size, weight and power consumption as compared with current direct synthesis techniques. The hardware implementation was to

highlight Surface Acoustic Wave (SAW) device applications specifically geared toward addressing performance parameters such as switching speed, frequency step size, and total achievable bandwidth, as well as maximum suppression of spurious modes. The approach chosen was to incorporate SAW devices as oscillators and delay lines/filters, together with monolithic large scale itnegrated circuits which work at RF frequencies (RF-LSI) is an iterative mix-and-divide architecture. To this end, a brassboard synthesizer has been fabricated and delivered. At program completion, the brassboard unit is fully operational and has been tested in order to characterize typical unit performance capabilities. The delivered synthesizer demonstrated outstanding switching speed, settling in less than 25 ns and provided an output whose phase noise was measured to be within the specified requirements, as measured to within 2 MHz of the carrier at an output frequency of 1308 MHz. Output spectral flatness was obtainable to within + or - 1.2 dB over the operational band, with achievable output power greater than +10 dBm. (Author)

PAT-APPL-6-267 178 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Real-Time 3D X-Ray and gamma-Ray Viewer.
Patent Application,
L. I. Yin. Filed 22 May 81, 21p N82-10862/2, NASA-CASE-GSC-12640-1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A multi-pinhole aperture lead screen forms an equal plurality of invisible mini-images having dissimilar perspectives of an X-ray and gamma-ray emitting object onto a rare-earth phosphor layer which, in turn, provides visible light mini-images directly into a visible light image intensifier. A viewing screen having an equal plurality of dissimilar perspective apertures distributed across its face in a geometric pattern identical to the lead screen, provides a viewer with a real, pseudoscopic image of the object with full horizontal and vertical parallax.

PAT-APPL-6-276 748 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Active Lamp Pulse Driver Circuit.
Patent Application,
K. E. Logan. Filed 24 Jun 81, 24p N82-10390/4, NASA-CASE-GSC-12566-1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A flashlamp drive circuit is described in detail. The device uses an unsaturated transistor as a current mode switch to periodially subject a partially ionized gaseous laser excitation flash-lamp to a stable, rectangular pulse of current from an incomplete discharge of an energy storage capacitor. A monostable multivibrator sets the pulse interval, initiating the pulse in response to a flash command by providing a reference voltage to a non-inverting terminal of a base drive amplifiers. A tap on an emitter resistor provides a feedback signal sensitive to the current amplitude to an inventory terminal of the amplifier, thereby controlling the pulse amplitude. The circuit drives the flashlamp to provide a square-wave current flashlamp discharge.

PAT-APPL-6-301 077 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Tuned Analog Network.
Patent Application,
E. J. Pyle, Jr. Filed 10 Sep 81, 14p N82-10324/3, NASA-CASE-GSC-12650-1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A non-inverting, direct current amplifier stage is cascaded into an integrator stage to form a two stage tuned network having a single input junction common to both stages. The network provides independent adjustment of center frequency, bandwidth and voltage gain. The insertion of a positive feedback loop between the stages provides a very narror bandwidth network. The addition of back-to-back Zener diodes between the common input node and ground converts the network into an oscillator.

PAT-APPL-6-308 009 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Focal Axis Resolver for Offset Reflector Antennas.
Patent Application,
R. F. Schmidt. Filed 2 Oct 81, 20p N82-10287/2, NASA-CASE-GSC-12630-1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A method and apparatus for determining the focal axis of an asymmetrical antenna (such as an offset paraboloid reflector) are described. A transmitting feed horn array is located at the known focal point of an offset reflector antenna and aligned with an estimated focal axis of the antenna. The array is coupled to an amplitude or phase comparison feed circuit which is adapted to provide sum and difference output fields. The feed horn array is rotated in discrete steps in at least one plane about an axis through the focal point of the antenna. At each step the far field radiation is received and detected in amplitude and the minimum value of the difference pattern at each step is noted. An indication of the true focal axis is provided by the extreme values of difference signal or the relative phase difference.

PB82-859471 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
MOS Circuits. 1970-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 255p
Supersedes PB81-859100.

Citations in this bibliography cover principles, techniques, and technology related to the design and applications of metal oxide semiconductor (MOS) circuits. The uses of MOS circuits in integrated circuit (IC) devices and in large scale integrated (LSI) circuit devices are covered prominently. Characteristics and performance of metal oxide semiconductors used in various MOS circuits are considered, along with methods for their fabrication. (This updated bibliography contains 299 citations, 38 of which are new entries to the previous edition.)

PB82-859489 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
MOS Circuits. 1970-1981 (Citations from the NTIS Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 291p
Supersedes PB81-859092.

This bibliography covers theory and technology for metal oxide semiconductor (MOS) circuit design and applications. MOS integrated circuit (IC) devices and MOS large scale integrated circuit (LSI) devices are considered with regard to design, fabrication, and reliability. Some key applications are in microprocessors, minicomputers, dynamic amplifiers, frequency multipliers, and ladder filters. (This updated bibliography contains 260 citations, 40 of which are new entries to the previous edition.)

PB82-859513 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Overhead Power Transmission. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 165p
Supersedes PB81-854812. Prepared in cooperation with the Department of Energy, Washington, DC.

Citations in this bibliography cover the design, operation, control, performance, protection, and economics of overhead power transmission systems or networks. Theoretical and practical considerations of related materials, apparatus, and technology are included. Some consideration is also given to simulation and modeling. Environmental and biological aspects of overhead power transmission are excluded. (This updated bibliography contains 176 citations, 47 of which are new entries to the previous edition.)

PB82-859828 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Triode AC Semiconductor Switch Circuits. 1974-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for Jan 74-Dec 81.
Dec 81, 264p

Articles cited in this bibliography discuss the design and applications of triac circuits, and triac triggering circuits. The use of triac circuits in light dimmers, speed controllers for motors, and power regulators in general are discussed. Other topics include a discussion of triac design, optically controlled triacs, and the use of such devices as the 555 timer and multivibrators for triggering circuits. (Contains 296 citations fully indexed and including a title list.)

10.

ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

AD-A106 826/1 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Transportation Contingency Plans for Future Gas Shortages will not Meet Commuter Needs.
1 Jul 81, 53p Rept no. GAO/CED-81-79
Report to the Congress.

The disruption caused by gasoline shortages of the 1970s and the resulting problems commuters experienced pointed out the need to prepare for future shortages. The Department of Transportation has encouraged the development of transportation contingency plans at the local level to maintain commuter mobility during petroleum shortages. Few urban areas, however, have prepared plans which would be very helpful. Further, progress in developing contingency plans has slowed down in many areas. New efforts are needed to spur areas to complete contingency plans and improve plans already developed so that all areas will be better prepared to respond to commuters' transportation needs, should they arise. (Author)

AD-A106 833/7 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Consumers Need More Reliable Automobile Fuel Economy Data.
28 Jul 81, 34p Rept no. GAO/CED-81-133
Report to the Chairman, Committee On Energy and Commerce, House of Representatives.

Every new automobile sold in the United States has a label showing its tested fuel economy. In addition, all fuel economy test results are published annually to encourage the production and purchase of more fuel-efficient automobiles. Consumers are skeptical, however, because their on-road experience often falls far short of the tested mileage figures.

AD-A106 860/0 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Questions Concerning DOE's Assignment of Operating and Testing Responsibilities for OTEC-1.
30 Jun 81, 12p Rept no. GAO/EMD-81-92

OTEC is one of the potential energy sources being developed to provide alternatives for reducing the Nation's dependence on imported oil. When developed, OTEC is to use the temperature variants of the ocean to produce electricity and energy intensive products. OTEC-1 is a major part of DOE's developmental program for OTEC. It is a floating test facility designed primarily for conducting sea tests of the cleanability

and performance of heat exchangers, a major component of OTEC systems. Related OTEC subsystems are also being tested. OTEC-1 was to be accomplished in three phases; design (phase I); construction (phase II); and operations and testing (phase III). In July 1977, DOE contracted with TRW, Inc. to design and develop the heat exchanger to be used on OTEC-1. In September 1978, DOE contracted with Global Marine to refurbish, retrofit, and deploy an old Navy ship with OTEC subsystems including TRW's heat exchanger. Together Global Marine and TRW were the OTEC-1 design and construction contractors for phases I and II with Global Marine having overall responsibility for integrating its and TRW's work. Global Marine's contract also included an option for performing work in phase III. (Author)

AD-A106 872/5 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Ohio's 1981 Home Energy Assistance Program.
15 Jul 81, 9p Rept no. GAO/HRD-81-122

The low Income Energy Assistance Program for 1981 is authorized by the Home Energy Assistance Act of 1980 (Public Law 96-223, Apr. 2, 1980). Under the act, the Secretary of HHS may make grants to States in accordance with approved plans for providing assistance to eligible households, enabling them to meet rising home energy costs. Ohio was allocated $90,081,158 for the Federal fiscal year 1981 (Oct. 1, 1980, through Sept. 30, 1981). Its Department of Economic and Community Development is responsible for administering the Home Energy Assistance Program (HEAP). (Author)

AD-A106 887/3 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
The Oil Shale Corporation Loan Guarantee Contract.
10 Sep 81, 14p Rept no. GAO/EMD-81-142

The loan guarantee contract with The Oil Shale Corporation (Oil Shale) is generally consistent with the requirements of The Defense Production Act of 1950, as amended, (DPA). However, it is questionable whether three aspects of DPA were fully adhered to. The first relates to the requirement that financial assistance be for synthetic fuels to meet national defense needs. Although on June 27, 1981, the Secretary of Defense certified that the Department of Defense (DOD) needs the project's synthetic fuel product for the national defense, we noted that the contract suggests otherwise. The contract calls for DOD to purchase from Oil Shale fuels at market prices which are not necessarily derived from the syncrude, unless DOD exercises an option to purchase the syncrude directly. The second aspect regards whether immediate actions were taken to achieve synthetic fuels production for national defense needs. While immediate actions were taken after enactment of the DPA amendments to set a process in place for implementing the program authorized, it is questionable whether the process was as timely as possible. Due to time constraints, we were unable to analyze the potential advantages and disadvantages of alternative approaches which might have reduced the overall time frame for making awards. The policy statement regarding geographic dispersion of facilities was not met because the two awards under DPA are in the same geographic area. However, the Department of Energy (DOE) stated the facilities are the first to be able to start construction in the next year and a practical problem exists.

AD-A106 902/0 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Energy Impacted Area Development Assistance Program's Designation Criteria.
26 Jun 81, 10p Rept no. GAO/EMD-81-103

The Energy Impacted Area Development Assistance Program was established by section 601 of the Powerplant and Industrial Fuel Use Act of 1978 (P.L. 95-620, November 9, 1978). The objective of the program is to help areas impacted by coal or uranium production, processing, or transportation. The program is funded through DOE and administered by the Farmers Home Administration of the Department of Agriculture. It provides grants for both the development of growth management and housing plans and the development and acquisition of sites for housing and public facilities. For fiscal years 1979 and 1980, $61 million was allocated to a total of 23 States. Ten percent of that amount, about $6 million, was for planning grants and the remainder, about $55 million, was for site acquisition and development. The types of projects currently being financed under the program include site acquisition for a housing project for the elderly, site development for a water storage facility, water and sewer lines for a housing project, and site acquisition and development for a health complex. (Author)

AD-A106 903/8 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Minerals Critical to Developing Future Energy Technologies, Their Availability, and Projected Demand.
25 Jun 81, 36p Rept no. GAO/EMD-81-104

The next 20 to 30 years are expected to be a period of transition from major dependence on conventional energy sources such as oil and natural gas to an era more dependent on nonconventional renewable and virtually inexhaustible sources of energy. The viability of these future alternative energy sources is contingent, in part, on future materials and minerals availability, technology, and cost. On June 20, 1980, you asked GAO to identify minerals critical to developing future energy technologies, their availability, and projected demand. In your letter, you stated that strategic and critical minerals constraints on the United States capability to meet expected requirements of future major alternative energy technologies represent a critical consideration in formulating a national energy policy and, as such, are of immediate interest to the Committee. From GAO's effort, you stated that the Committee should be able to 'identify whether legislation is needed to develop new alloys or substitutes; increase domestic, foreign, and undersea supplies; develop new technologies; promote recycling; augment stockpiles, etc.' (Author)

AD-A106 904/6 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Burdensome and Unnecessary Reporting Requirements of the Public Utility Regulatory Policies Act Need to be Changed.
Report to the Congress.
14 Sep 81, 34p Rept no. GAO/EMD-81-105

This report addresses the need to continue two sections--116 and 133--of the Public Utility Regulatory Policies Act of 1978. Title I of the act was established to encourage conservation of energy supplied by electric utilities, efficiency in use of facilities and resources by these utilities, and equitable rates to electricity consumers. Section 116 requires annual reporting by State regulatory authorities, nonregulated electric utilities, and the Department of Energy, on their status in complying with parts of the act relating to consideration of retail electric regulatory and ratemaking standards. Section 133 of the act requires certain utilities to biennially submit extensive cost-of-service filings to the Federal Energy Regulatory Commission and their respective State regulatory authorities. GAO, recommends that the Congress repeal the annual reporting requirement effective after the third annual report, and that the Federal Energy Regulatory Commission review and revise its cost-of-service reporting regulations to reduce the burden on utilities. If this review finds the reporting costs to be greater than the reporting benefits, the Commission should ask the Congress to repeal the cost-of-service reporting requirement.

AD-A106 916/0 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Elimination of Federal Funds for the Heber Project will Impede Full Development and Use of Hydrothermal Resources.
25 Jun 81, 25p Rept no. GAO/EMD-81-110
Report to the Chairman, Subcommittee on Energy Development and Applications, Committee on Science and Technology House of Representatives.

High-temperature hydrothermal resources have a significant potential for generating electricity which can help reduce the Nation's dependence on fossil fuels. The majority of these resources, however, can only be efficiently used with binary cycle geothermal technology. The Department of Energy was sharing the cost of the Heber binary cycle geothermal demonstration project to show the viability of binary cycle geothermal powerplants and stimulate the use of this technology. However, the administration has proposed to eliminate Federal funding of this project. The administration believes that private industry should solely undertake this demonstration project. The elimination of Federal funding for this project could cause it to be terminated. Private industry currently cannot undertake this project, because of its high technical risks and economic uncertainties, without the assistance of the Government.

AD-A106 919/4 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Options for Establishing an Energy Conservation Consolidated Grant Program.
8 Jul 81, 14p Rept no. GAO/EMD-81-115

The choice of design features for block grants is properly a political function that should be driven by the ultimate objectives the Congress is seeking to achieve. Block grants intended to continue Federal stewardship of national objectives in a more flexible or decentralized manner should have significantly different design features than block grants intended principally to devolve Federal responsibilities back to State and local governments. In designing a block grant program, the Congress must consider the trade-offs between State and local discretion and Federal control. At one end of the spectrum, block grants may become indistinguishable from general revenue sharing, if, for example, a maintenance of effort provision is not included. On the other hand, detailed Federal eligibility rules, standards, or funding requirements could transform the block grant into a categorical grant, thus lessening any benefits that could be realized from greater State and local discretion. A balance should be sought between the extent of flexibility provided to State and local governments and the degree of accountability to the Federal Government required to assure that the program's national objectives will be met. A number of different provisions can be incorporated into block grants to facilitate the achievement of national objectives. The provisions considered should be nonintrusively framed to encourage States and localities to meet national objectives in the broadest possible way and provide flexibility. The provisions could encourage achievement of goals without specifying the means to be used. (Author)

AD-A106 921/0 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
The United States Remains Unprepared for Oil Import Disruptions. Volume I. Summary: Includes Conclusions and Recommendations.
Report to the Congress.
29 Sep 81, 87p Rept no. GAO/EMD-81-117-VOL-1
See also Volume 2, AD-A106 922.

The U.S. Government is almost totally unprepared to deal with disruptions in oil imports. Oil import disruptions--such as the 1973 oil embargo and the 1979 Iranian shortfall--pose a significant threat to national security, and the lack of effective contingency planning and program development to data is serious and requires immediate attention. The Government must make a determined commitment to emergency preparedness now, while oil markets are slack, to prepare for any future disruption.

AD-A106 922/8 PC **A11**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
The United States Remains Unprepared for Oil Import Disruptions. Volume II. Detailed Review of Current Emergency Programs and Alternative Approaches.
Report to the Congress.
29 Sep 81, 226p Rept no. GAO/EMD-81-117-VOL-2
See also Volume 1, AD-A106 921.

For abstract see AD-A106 921.

AD-A106 924/4 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Federal Energy Regulatory Commission Needs to Act on the Construction-Work-in-Progress Issue.
23 Sep 81, 12p Rept no. GAO/EMD-81-123

The financial indicators of the electric utility industry have deteriorated due to high inflation, high interest rates, accelerating construction costs, decline in demand, and a less than adequate rate of return. This has led to uncertainty about the industry's ability to attract investment capital. GAO sees the real issues as

being whether companies need rate relief to maintain financial integrity, and whether construction programs which depend on such relief are needed to meet future electric energy demands.

AD-A107 106/7 PC **A16**/MF **A01**
Department of Energy, Washington, DC.
Symposium on Commercial Aviation Energy Conservation Strategies, April 2-3, 1981. Papers and Presentations.
Apr 81, 354p
Prepared in cooperation with Federal Aviation Administration, Washington, DC.

The Symposium provided a forum in which representatives from DOE, FAA, National Aeronautics and Space Administration (NASA) and the aviation industry exchanged information and ideas regarding current and future efforts to conserve fuel and to promote energy conservation within the commercial aviation sector. General topics discussed included Federal and industry energy conservation programs such as flight operations, air traffic control, engineering and maintenance, and corporate management strategies. The Symposium, was highlighted by a panel discussion entitled 'Energy Conservation: Where Do We Go From Here.' This report contains the papers and presentations from the Symposium.

ALO-3985-1 PC **A24**/MF **A01**
General Electric Co., Philadelphia, PA. Space Div.
Solar Total Energy: Large Scale Experimental at Shenandoah, Georgia. Phase III. Preliminary Design. Final Report, October 1, 1977-July 31, 1978.
Sep 78, 567p
Contract AC04-77ET20260
Portions of document are illegible.

The basic function of the STES at Shenandoah is to supply the electric power, process steam, and space heating and cooling demands of the expanded 3900 square meters (42,000 ft exp 2) Bleyle Plant and for the STES Mechanical Building. The Bleyle factory, initially equipped with its own independent (conventional) energy source, will derive at least 60% of its annual energy needs from the sun when the solar energy system becomes operational in the first quarter of 1981. The design and systems analysis of the STES are detailed. The Solar Collection Substation consists of an array of 192 seven meter diameter, parabolic dish collectors which provide a temperature rise to a flow of Syltherm 800 fluid through each collector in a parallel closed, hydraulic circuit. The receiver is a cavity type with the incident concentrated solar flux impinging upon an absorptive surface enclosed within an insulated cylindrical shell. The trickle oil/dual media concept was selected for the high temperature storage system. The Power Conversion Subsystem consists of a three piece pool-type boiler with preheater, boiler, and superheater, a GFE steam turbine-generator set rated at 400kWe supplied by Mechanical Technology, Inc., a condenser and condensate storage tank, make-up demineralizer, deaerating heater, and boiler feed pump. In normal operation, steam at 655 exp 0 K (720 exp 0 F) and 4.8 x 10 exp 6 N/m exp 2 (700 psig) is generated in the boiler-super-heater, heated by Syltherm 800, and delivered to the turbine inlet. The Thermal Utilization Subsystem major components include a 2.1 x 10 exp 10 Joule (20 MBtu) capacity, sensible heat water, low temperature storage (LTS) subsystem, a 1.25 x 10 exp 6 Joules/second (354 ton) absorption chiller derated to provide 6.09 x 10 exp 5 Joules/second (173 tons) with inlet hot water at 372 exp 0 K (210 exp 0 F), and two separate cooling towers for heat rejection from both the absorption chiller and the PCS condenser. (ERA citation 06:004669)

CONF-790845-(Sup.) PC **A05**/MF **A01**
Pacific Northwest Solar Energy Association, Seattle, WA.
Solar 79 Northwest.
S. King. 1979, 88p
Contracts EU-78-G-01-4192, EM-75-F-01-8162
Solar 79 Northwest conference, Seattle, WA, USA, 10 Aug 1979.

The highlights of the many public programs are described and summaries of plenary session speeches are included. Names, addresses, and solar interest codes of conference registrants are included. Eleven technical papers or summaries are included. A separate citation was prepared for each one. (ERA citation 05:015077)

DE81028923 PC **A13**/MF **A01**
Kansas Univ., Lawrence. Applied Energy Research and Public Service Program.
Integration of Solar Energy into Utility-System Planning and Strategies: 1980-2000.
Jul 80, 288p CONF-8005180-
Conference on the integration of solar energy into utility system planning and strategies: 1980-2000, Topeka, KS, USA, 11 May 1980.

The purpose of the conference was to address the following questions that the utility industry must face as they make short and long-range plans to meet the nation's energy needs: (1) How do utilities develop plans for solar energy in demand forecasting, plant expansion, capital requirements, load management, and consumer relations. (2) Which solar technologies will emerge as dominant in the future. (3) What rate of growth in the utilization of solar energy can be expected by utility managers. (4) How can utilities use information on developments in solar technology in their operations, planning, and management. (5) What part can utilities expect to play in the financing and control of major solar energy technologies. The views and information presented at the conference are recorded in 17 speeches and presentations. (ERA citation 06:034501)

DE81030030 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Modeling Solar-Energy Systems for Economic Optimization.
R. W. Leigh. 1981, 6p BNL-29963, CONF-811030-2
Contract AC02-76CH00016
World engineering congress, Atlanta, GA, USA, 12 Oct 1981.

A simple analytic model of solar energy systems is presented which can describe how the performance of the system depends on collector area and storage capacity with surprising accuracy. The model can then be used to determine easily the optimal (lower cost) configuration of collector area and storage capacity, and to see how this configuration will change under various possible fuel, collector, or storage costs. (ERA citation 06:034497)

DE81030997 PC **A07**/MF **A01**
National Center for Analysis of Energy Systems, Upton, NY.
Expert Judgments for Policy Analysis.
M. G. Morgan, M. Henrion, and S. C. Morris. 1980, 138p BNL-51358
Contract AC02-76CH00016

This report summarizes the deliberations of a small invitational three-day workshop, which explored the current state of the art and identified research needs in eliciting and using subjective probabilistic expert judgments for policy analysis involving energy and environmental systems. Part 1 of this report discusses the growing importance of these techniques and outlines the structure and objectives of the workshop. Part 2 summarizes many of the workshop's most-important deliberations. Part 3 contains a preliminary description of some of the essential elements of a program of national research which should be mounted in this area in order to provide the theoretical and applied understanding necessary to support a widespread adoption of techniques that use subjective expert judgments, stated in probabilistic terms, by regulatory agencies that are concerned with energy and environmental systems. (ERA citation 06:034960)

DE81031932 PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Vertical Axis Wind Turbine Control Strategy.
G. M. McNerney. Aug 81, 21p SAND-81-1156
Contract AC04-76DP00789

Early expensive in automatic operation of the Sandia 17-m vertical axis research wind turbine (VAWT) has demonstrated the need for a systematic study of control algorithms. To this end, a computer model has been developed that uses actual wind time series and turbine performance data to calculate the power produced by the Sandia 17-m VAWT operating in automatic control. The model has been used to investigate the influence of starting algorithms on annual energy production. The results indicate that, depending on turbine and local wind characteristics, a bad choice of a control algorithm can significantly reduce overall energy production. The model can be used to select control algorithms and threshold parameters that maximize long-term energy production. An attempt has been made to generalize these results from local site and turbine characteristics to obtain general guidelines for control algorithm design. (ERA citation 06:034671)

DE82000149 PC **A03**/MF **A01**
Argonne National Lab., IL.
Technology Assessment of Solar Energy Systems: Potential Soil Erosion Effects of Harvesting Crop Residues for Energy Production.
M. F. Torpy, L. J. Habegger, M. A. Snider, and T. G. Surles. Jan 81, 38p ANL/EES-TM-152
Contract W-31-109-ENG-38

An evaluation is presented of the potential increase in erosion that could result from removal of the ground cover that the residues provide. The study indicates that removal of crop residues sufficient to produce 0.13 and 0.42 x 10 exp 15 Btu of end-use energy (as specified, respectively, in the two scenarios addressed by the Technology Assessment of Solar Energy Program) would have little effect on soil erosion except in a few areas. An alternative scenario is addressed in which all reasonably available crop residues would be harvested to produce 1.5 x 10 exp 15 Btu of end-use energy. The approach used in evaluating erosion due to removal of residue is also described. (ERA citation 06:034503)

DE82000252 PC **A03**/MF **A01**
Brookhaven National Lab., Upton, NY.
Strategic Analysis of Conservation and Solar Energy Policies.
R. J. Goettle, IV, P. J. Groncki, and E. A. Hudson.
Jun 80, 27p BNL-51373
Contract AC02-76CH00016

A wide range of specific policy measures concerned with increasing the technical efficiencies of energy use and promoting the use and competitiveness of various solar, renewable resource, and conservation technologies are examined. The focus is on the socioeconomic impacts of two policy packages - the Basic and the Enhanced. The packages are examined for their economic, distributional, energy, and environmental effects. The introduction of the Basic package of conservation and solar programs is estimated to have favorable impacts on all major socioeconomic criteria - energy imports and energy use, real incomes and productivity, inflation, distribution, and environment. Intensifying the policy measures beyond those in the Basic package, or at least intensifying them in the direction defined by the Enhanced package, creates additional energy and economic benefits but the economic improvements cannot match the costs imposed by the new policies. (ERA citation 06:034985)

LA-UR-80-2134 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Overview of the US Program for Nonconvecting Solar Ponds.
D. A. Neeper. 1980, 7p CONF-800757-2
Contract W-7405-ENG-36
Nonconvecting solar pond workshop, Washington, DC, USA, 30 Jul 1980.

A brief history of research on solar ponds in the US is given; LASL's role in solar pond development is reviewed; and suggestions for future solar pond research are given. (ERA citation 05:032048)

LA-7689-M(Ver.2.1)(Pt.1) PC **A99**/MF **A01**
Los Alamos Scientific Lab., NM.
DOE-2 Reference Manual.
D. A. York, and E. F. Tucker. May 80, 660p LBL-8706(Rev.1)(Pt.1)
Contracts W-7405-ENG-36, W-7405-ENG-48

A new, user-oriented language, the Building Description Language, has been written to describe a building and its operation. DOE-2 includes: a Building Description Language (BDL) program to analyze the input instructions, perform data assignments and data retrieval, and control the operation of the LOADS, SYSTEMS, PLANT, ECONOMICS, and REPORT programs; a LOADS analysis program, which calculates peak, or design, loads and hourly space loads imposed by ambient weather conditions and internal occupancy, lighting, and equipment, as well as by variations in the size, location, orientation, construction, and materials for walls, roofs, floors, fenestrations, attachments (e.g., awnings or balconies), and the shape of a building; a SYSTEMS program capable of simulating the operation of secondary HVAC components, including

fans, coils, economizers, and humidifiers, which may be arranged in various user-selected configurations and may be operated according to various temperature schedules; a PLANT program, which models the operation of primary HVAC components (e.g., boilers, chillers); electrical generation equipment (e.g., diesel engines or turbines), energy storage and solar heating and/or cooling systems; an ECONOMICS analysis program, which calculates life-cycle costs; a REPORT program that generates the output reports, and a set of WEATHER ANALYSIS programs capable of manipulating, summarizing, and plotting weather data. A library of weather data for 60 locations in the US; a construction library containing data on the properties of walls, roofs, and floors; and a materials library containing data on the common building materials are available in machine addressable form. The other library data are available only in printed form. Input and output samples are included to illustrate the use of DOE-2. The DOE-2 language processors, solar simulator and economics evaluation program are new. (ERA citation 05:032444)

LA-8137-TASE PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Preliminary Definition and Characterization of a Solar Industrial Process Heat Technology and Manufacturing Plant for the Year 2000.
T. Prythero, and R. T. Meyer. Nov 79, 34p
Contract W-7405-ENG-36

A solar industrial process heat technology and an associated solar systems manufacturing plant for the year 2000 has been projected, defined, and qualitatively characterized. The technology has been defined for process heat applications requiring temperatures of 300 exp 0 C or lower, with emphasis on the 150 exp 0 to 300 exp 0 C range. The selected solar collector technology is a parabolic trough collector of the line-focusing class. The design, structure, and material components are based upon existing and anticipated future technological developments in the solar industry. The solar system to be manufactured and assembled within a dedicated manufacturing plant is projected to consist of the collector and the major collector components, including reflector, absorber, parabolic trough structure, support stand, tracking drive mechanism, sun-sensing device and control system, couplings, etc. Major manufacturing processes to be introduced into the year 2000 plant operations are glass-making, silvering, electroplating and plastic-forming. These operations will generate significant environmental residuals not encountered in present-day solar manufacturing plants. Important residuals include chemical vapors, acids, toxic elements (e.g. arsenic), metallic and chemical sludges, fumes from plastics, etc. The location, design, and operations of these sophisticated solar manufacturing plants will have to provide for the management of the environmental residuals.In addition, national level evaluations of the economic and environmental impacts of expanded solar technologies will have to account for these new operations for new solar manufacturing plants that may be located at enlarged or new industrial sites across the nation. (ERA citation 05:011677)

LA-8497-MS PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Bidding and Production Profiles for the Various Outer Continental Shelf Leasing Methodologies, 1954 to 1978.
L. A. Bruckner, and G. J. Thomas. Aug 80, 44p
Contract W-7405-ENG-36

The 1978 Outer Continental Shelf Lands Act Amendments charged the government with promulgating new regulations concerning the leasing of offshore tracts for hydrocarbon development. Among the reasons for this charge were to increase competition, reduce front-end money, and stimulate production. We used box plots to provide profiles of the bidding and production data from the different historical leasing methodologies. These profiles can be used to provide insights into the present data and to allow comparison with results of the new regulations. (ERA citation 05:033267)

LASL-80-10(BRIEF) PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
US Energy Sources and Materials Needs.
D. A. Freiwald. Apr 80, 8p
Contract W-7405-ENG-36

It takes energy to build energy systems, and energy to obtain the nonrenewable fuels. This energy must be added to the energy used by consumers to obtain the total US energy demand. The minerals crisis is discussed in relation to the worldwide population minerals resource demand. As the world consumes its high-grade ores, lower-grade ores will be used at increasing expense. Part of the expense is due to the fact that it takes much more energy at increasing expense to process low-grade ores. It must also be recognized that high-grade energy sources are needed to obtain and fabricate the materials for soft-technology systems. Needed actions are noted. (ERA citation 05:022507)

LBL-6865 PC **A04**/MF **A01**
California Univ., Berkeley.
Saving Half of California's Energy and Peak Power in Buildings and Appliances Via Long-Range Standards and Other Legislation.
A. H. Rosenfeld, D. B. Goldstein, A. J. Lichtenberg, and P. P. Craig. 10 May 78, 54p
Contract W-7405-ENG-48

If energy and peak electric power were valued at their replacement costs, new buildings (including homes) and appliances would consume roughly half of what they do today, and old buildings would be retrofit so as to achieve similar reductions. The potentials for improved use of energy in refrigerators, homes, and stoves, and peak power shaving by storage of chilled water for air-conditioning are discussed. State legislation needed to achieve these reductions, particularly long-range standards, and the mechanisms required to make them acceptable is described. (ERA citation 05:013733)

MIT-2295T9-15 PC **A10**/MF **A01**
Massachusetts Inst. of Tech., Cambridge.
Computer-Aided Industrial Process Design. The ASPEN Project. Fourteenth and Fifteenth Quarterly Progress Report, 1 September 1979-29 February 1980.
15 Mar 80, 211p
Contract AT01-76ET10696

ASPEN is operational and a production version has been made available for industrial test participants. Changes for improvements or for fixes to problems are being made regularly in response to user inputs. Some catalogued procedures called executives in CMS language at MIT have been implemented for users to allow convenient execution of ASPEN and to print out results. A preliminary User's Manual of about 1000 pages has been prepared. Training materials have been developed for an introductory user course. Three courses have been held and 92 users have attended these. The four principal areas of work during this period were in documentation, instruction, coding and testing. The remaining model abstracts were completed. A description of the input language for the economic evaluation system was completed. This description will ultimately be incorporated in the User's Manual along with supporting documentation. Several demonstration problems, were prepared on cost estimation. A Data Regression System has been completed. (ERA citation 05:030101)

MLM-MU-80-62-0001 PC **A04**/MF **A01**
Mound Facility, Miamisburg, OH.
Proceedings: Utilities Operations Seminar.
1979, 52p
Contract EY-76-C-04-0053

The proceedings of the Utilities Operations Seminar are given and the papers presented are noted. Titles of presentations are Facilities Management Branch; Fuel Policy, and the Alternate Energy Source Program; Operators Selection and Training; Utilities Systems at Mound; Water Treatment and Waste Water Treatment; Utilities Operator Classification; Operator Training; Utilities Monitoring System; Reverse Osmosis System; Waste Water Management; and Environmental Program. Many visual aids are included for the paper presentations. (ERA citation 05:019007)

N82-11549/4 PC **A03**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Irrigation Market for Solar Thermal Parabolic Dish Systems.
H. Habib-agahi, and S. C. Jones. 1 Sep 81, 40p
NASA-CR-164955, JPL-PUB-81-85
Contracts NAS7-100, DE-AT04-81AL-16228

The potential size of the onfarm-pumped irrigation market for solar thermal parabolic dish systems in seven high-insolation states is estimated. The study is restricted to the displacement of three specific fuels: gasoline, diesel and natural gas. The model was developed to estimate the optimal number of parabolic dish modules per farm based on the minimum cost mix of conventional and solar thermal energy required to meet irrigation needs. The study concludes that the potential market size for onfarm-pumped irrigation applications ranges from 101,000 modules when a 14 percent real discount rate is assumed to 220,000 modules when the real discount rate drops to 8 percent. Arizona, Kansas, Nebrasks, New Mexico and Texas account for 98 percent of the total demand for this application, with the natural gas replacement market accounting for the largest segment (71 percent) of the total market.

N82-11550/2 PC **A03**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Secondary and Compound Concentrators for Parabolic Dish Solar Thermal Power Systems.
L. D. Jaffe, and P. T. Poon. 15 Apr 81, 47p NASA-CR-164960, JPL-PUB-81-27
Contract NAS7-100
Sponsored in Part by Doe.

A secondary optical element may be added to a parabolic dish solar concentrator to increase the geometric concentration ratio attainable at a given intercept factor. This secondary may be a Fresnel lens or a mirror, such as a compound elliptic concentrator or a hyperbolic trumpet. At a fixed intecept factor, higher overall geometric concentration may be obtainable with a long focal length primary and a suitable secondary matched to it. Use of a secondary to increase the geometric concentration ratio is more likely to e worthwhile if the receiver temperature is high and if errors in the primary are large. Folding the optical path with a secondary may reduce cost by locating the receiver and power conversion equipment closer to the ground and by eliminating the heavy structure needed to support this equipment at the primary focus. Promising folded-path configurations inclue the Ritchey-Chretien and perhaps some three element geometries. Folding the optical path may be most useful in systems that provide process heat.

ORAU/IEA-80-10(M) PC **A04**/MF **A01**
Oak Ridge Associated Universities, Inc., TN. Inst. for Energy Analysis.
Stochastic Sun: Understanding the Intermittent Resource.
D. A. Boyd. Jun 80, 51p
Contract AC05-76OR00033

The concept of the ideal system is introduced as a device for separating resource limits from system effects. The limitations on ideal system performance arising from intermittency are examined and the relationship between real systems and ideal systems are discussed. The general nature of the results of such an approach and of their implications for solar utilization are illustrated. (ERA citation 05:031778)

ORAU/IEA-80-2(M) PC **A03**/MF **A01**
Oak Ridge Associated Universities, Inc., TN. Inst. for Energy Analysis.
Social Control of Energy: A Case for the Promise of Decentralized Solar Technologies.
R. W. Gilmer. May 80, 42p
Contract AC05-76OR00033

The case for simplified social control is developed in two ways. First, decentralized solar technology and centralized electric utilities are contrasted in the ways they assign property rights in capital and energy output; in the assignment of operational control; and in the means of monitoring, policing, and enforcing property rights. Second, an analogy is drawn between the decision of an energy consumer to use decentralized solar and the decision of a firm to vertically integrate, that is, to extend the boundary of the firm by making inputs or further processing output. Decentralized solar energy production offers the small energy consumer the chance to cut ties to outside suppliers - to vertically integrate energy production into the home or business. The development of this analogy provides insight into important noneconomic aspects of solar energy, and it points clearly to the lighter burdens of social management offered by decentralized solar technology. (ERA citation 05:026584)

ORNL/CON-53 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.

Energy Use in Minnesota Public Buildings: Data Management and Analysis.
E. Hirst, and C. Eastes. Aug 80, 48p
Contract W-7405-ENG-26

Data collected by the Minnesota Energy Agency from 1860 public buildings are examined. Considerable attention is devoted to questions of data quality. Validation tests are developed and applied to the data from these buildings. Roughly speaking, 15% of the data elements examined were missing and another 15% were almost surely incorrect. These errors seriously distort both the descriptive statistics and the regression results obtained from further analysis of this data. Examination of the clean data shows that total energy use in the 1977/78 fiscal year ranged from a low of 210 thousand Btu/ft exp 2 (2.39 billion J/m exp 2) for the typical garage to a high of 345 thousand Btu/ft exp 2 (3.92 billion J/m exp 2) for the typical hospital. More than half the buildings report natural gas and more than one-fourth report fuel oil as the primary heating fuel. Only 13% of the buildings are heated with electricity. Regression equations are developed to explain variations in energy use among buildings for fossil fuel, electricity, and total energy use per unit floorspace. Independent variables include fuel prices, heating degree days, annual operating hours for lights, fraction of the building air conditioned, and dummy variables for primary heating fuel and for hospitals. These equations can be used to help decide which buildings should receive on-site energy audits. (ERA citation 05:032461)

ORNL/Sub-7470/1-V3 PC **A18**/MF **A01**
Honeywell, Inc., Minneapolis, MN. Energy Resources Center.
Economic Evaluation of the Annual Cycle Energy System (ACES). Final Report. Volume III, Appendices.
Jun 80, 406p
Contract W-7405-ENG-26

This volume consists of seven appendices related to ACES, the first three of which are concerned with computer programs. The appendices are entitled: (A) ACESIM: Residential Program Listing; (B) Typical Inputs and Outputs of ACESIM; (C) CACESS: Commercial Building Program Listing; (D) Typical Weather-Year Selection Requirements; (E) Building Characteristics; (F) List of Major Variables Used in the Computer Programs; and (G) Bibliography. 79 references. (ERA citation 05:033769)

ORNL/Sub-79/45740/1 PC **A09**/MF **A01**
Variflex Corp., Washington, DC.
Worldwide Transportation/Energy Demand, 1975-2000. Revised Variflex Model Projections.
R. U. Ayres, and L. W. Ayres. Mar 80, 176p
Contract W-7405-ENG-26

The salient features of the transportation-energy relationships that characterize the world of 1975 are reviewed, and worldwide (34 countries) long-range transportation demand by mode to the year 2000 is reviewed. A worldwide model is used to estimate future energy demand for transportation. Projections made by the forecasting model indicate that in the year 2000, every region will be more dependent on petroleum for the transportation sector than it was in 1975. This report is intended to highlight certain trends and to suggest areas for further investigation. Forecast methodology and model output are described in detail in the appendices. The report is one of a series addressing transportation energy consumption; it supplants and replaces an earlier version published in October 1978 (ORNL/Sub-78/13536/1). (ERA citation 05:020804)

ORNL/TM-6977 PC **A19**/MF **A01**
Oak Ridge National Lab., TN.
State Flows of Energy in 1975.
P. L. Rice. Nov 79, 429p
Contract W-7405-ENG-26

This report highlights the distribution or flows of energy between states; it provides a supplement to Energy Availabilities for State and Local Development: 1975 Data Volume (ORNL/TM-6951). State flows are reported for the ten energy regions defined by the Department of Energy. Energy imports and exports are disaggregated into foreign and inter-regional components and the mode of transport indicated. The best analysis and presentation of energy flows is for natural gas. The report provides reference material on natural gas consumption, production, and distribution and has potential utility for: (1) determining the potential impact of curtailments; and (2) conducting cost-benefit analyses of the redistribution of natural gas between users and between states. Of equal significance is the integration and consolidation of data for crude oil and petroleum-product flows. Unpublished state-to-state flows by tanker and barge from PAD III (the largest petroleum-producing region) were combined with information on inter-regional pipeline shipments and foreign shipments to create a complete picture of the production, consumption, and distribution of all petroleum products, such as gasoline. There is additional information on flows of coal and electricity. The data for bituminous coal shipments between states is for utilities with 25 megawatts or greater capacity. The electricity data is based on the Form 412 reports filed by large utilities in 1974. (ERA citation 05:005869)

ORNL/TM-7297 PC **A05**/MF **A01**
Oak Ridge National Lab., TN.
Research on Noneconomic Factors Relevant to the Diffusion of Solar Total Energy Systems.
L. G. Berry, and L. M. Bronfman. Aug 80, 78p
Contract W-7405-ENG-26

This report has two major purposes: (1) to review and evaluate the policy uses of some of the concepts and models found in diffusion-of-innovation literatures other than those of economics and marketing and (2) to apply the results of this review to the specific case of a Solar Total Energy System (STES). The research effort had three parts. The first part was to identify and obtain an overview of the noneconomics social science literatures relevant to the problem of forecasting and accelerating adoption rates. After the first part was completed and the principal research perspectives and researchers in the field had been identified, a workshop of experts was organized to address the problem of predicting and accelerating diffusion rates for STESs. Finally, the results of the literature review and the workshop were summarized, and a number of approaches suggested by the diffusion literature were used to obtain an evaluation of the adoption potential of STES. Major conclusions of the report are (1) diffusion models have a limited predictive value; (2) a number of general policy guidelines for programs aimed at increasing diffusion rates are provided by the literature; and (3) STES diffusion is likely to be rather slow unless substantial contextual changes or policy interventions take place. (ERA citation 05:031871)

PAT-APPL-6-284 286 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office.
Solar Energy Modulator.
Patent Application,
A. R. McDougal, and R. R. Hale. Filed 17 Jul 81, 14p
N82-10496/9, NASA-CASE-NPO-15388-1
Contract NAS7-100
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A module is described with a receiver having a solar energy acceptance opening and supported by a mounting ring along the optic axis of a parabolic mirror in coaxial alignment for receiving solar energy from the mirror, and a solar flux modulator plate for varying the quantity of solar energy flux received by the acceptance opening of the module. The modulator plate is characterized by an annular, plate-like body, the internal diameter of which is equal to or slightly greater than the diameter of the solar energy acceptance opening of the receiver. Slave cylinders are connected to the modulator plate for supporting the plate for axial displacement along the axis of the mirror thereby shading the opening with respect to solar energy flux reflected from the surface of the mirror to the solar energy acceptance opening.

PB82-124405 PC **A08**/MF **A01**
Pacific Environmental Services, Inc., Santa Monica, CA.
Use of Fuel Oil by Stationary Sources in California.
Final rept.,
J. A. Trapasso, A. L. Shrope, and H. A. Rose. Mar 81, 169p PES-397, ARB-R-81/150
Contract ARB-A8-123-31

The report presents the methodology and results of a study to determine fuel oil usage by the agricultural, residential and industrial/commercial/institutional sectors in California during calendar year 1977. Fuel oil was defined to include both distillate and residual oils (Type Nos. 1, 2, 4, 5, and 6), but excluded crude oil burned as fuel. The use of fuel oil by power plants was not included in the study.

PB82-127036 PC **A02**/MF **A01**
National Weather Service, Salt Lake City, UT. Western Region.
Preliminary Estimates of Wind Power Potential at the Nevada Test Site.
Technical memo.,
Howard G. Booth. Jul 81, 19p NOAA-TM-NWS-WR-166, NOAA-81100801

The assessment of the potential for useful conversion of wind power to electrical power is quite complex because of the many factors involved, both of a climatological and an engineering nature. The climatologist's capability is in attempting to describe the available wind power for the Nevada Test Site (NTS) and comparing it in a relative sense with what is known for other parts of the country. Climatological factors of concern are the average magnitude of the wind power density (watts/m) and its spatial and temporal variability.

PB82-128679 PC **A04**/MF **A01**
Johns Hopkins Univ., Laurel, MD. Applied Physics Lab.
BIGMAC: Basic Interactive Geothermal Model with Aquifer Characterization; A User's Guide,
Peter Kroll, William F. Barron, Kwang Yu, and William J. Toth. Oct 81, 64p JHU/APL/QM-81-089
Contract DOE-EX-76-A-36-1008
Also pub. as Johns Hopkins Univ., Baltimore, MD. Center for Metropolitan Planning and Research rept. no. MCGER-81/001.

A User's Guide to the Basic Interactive Geothermal Model with Aquifer Characterization (BIGMAC) is presented. This program is an enhancement of a previously published program, the Demand Specified Model (DSM), to allow representation of a geothermal aquifer's characteristics and their effects on pumping energy and drawdown. The report lists the modifications made to DSM in order to create BIGMAC, describes how to operate the program, shows samples of the program's output, and summarizes the commands available in BIGMAC.

PB82-130907 PC **A06**/MF **A01**
Charles River Associates, Inc., Boston, MA.
Potential Fuel Conservation from Regulatory Reform of the Trucking Industry.
Final rept.
Jul 80, 106p CRA-446.01, DOT-P-50-81-92
Contract DOT-OS-90027

This study estimates the likely fuel savings from implementing 11 motor carrier regulatory reforms; some of which were enacted subsequently by the Motor Carrier Act of 1980. Fuel savings from implementing each reform separately as well as all together are given. Maximum feasible -- technically possible -- and most likely estimates are given.

PB82-135542 PC **A12**/MF **A01**
Illinois Univ. at Urbana-Champaign. Dept. of Civil Engineering.
Urban Transportation Energy Accounts. Volume I - Procedures. Volume II - Case Study of the Chicago Region.
Final rept. Jun 78-May 81,
D. E. Boyce, M. C. Romanos, B. N. Janson, P. Prastacos, and M. Ferris. Sep 81, 255p UMTA-IL-11-0027-81-1
Contract DOT-IL-11-0027

This manual describes procedures for compiling a set of urban transportation energy accounts. These procedures deal specifically with ground-mode person travel in an urbanized area but could be generalized to other modes, commodities and regions. There are several significant differences between these procedures and methods used by other studies to estimate the energy consumption of urban person trips. First, these procedures produce estimates of both direct and indirect energy consumption. Second, energy consumption is computed by mode for each origin-destination pair of zones. Third, automobile speeds and transit vehicle occupancies calculated for individual link flows are used to estimate energy consumption per person trip over each zone-to-zone trip path. Link flows are obtained from the use of trip assignment models in the UTPS or PLANPAC transportation planning computer software.

PB82-136482 PC **A10**/MF **A01**
New England River Basins Commission, Boston, MA.
Strategies for State Participation in OCS Exploration Decisions: Onshore Facilities Related to Offshore Oil and Gas Development.
Mar 80, 224p NERBC/RALI-5
Portions of this document are not fully legible.

The report discusses the many consultation documents the states will receive in the course of the OCS Exploration decision-making process. It also outlines planning needs, strategies for promoting state policies, and institutional and organizational options for effective participation in decision making. This document aims to provide state and local officials with information related to outer continental shelf (OCS) oil and gas development in frontier regions.

PB82-144569 PC **A03**/MF **A01**
Coalition of Northeast Municipalities, Boston, MA.
Municipal Energy Initiatives in the Northeast,
John Alschuler. Sep 80, 33p HUD-0002065
Contract HUD-H-4435

This report suggests ways that local governments can save energy both within their own operations and throughout their communities and introduces the issue of municipal energy management and community energy efficiency. The potential energy management activities of local government are discussed, including internal operations, crisis intervention, community energy conservation, community planning, production, and energy planning and data analysis. Some examples of local government energy initiatives are described, and characteristics of successful energy initiatives developed by Seattle, Wash., Portland, Oreg., Davis, Calif., are outlined. These characteristicsc include plan preparation using trained staff and public participation; mandatory provisions; emphasis on alternative energy resources; and financial incentives. Barriers to effective action in the northeast are outlined, including lack of clearly defined local authority, lack of resources, scarcity of local public planning data, and the small number of publicly - owned utilities. Six Federal actions are recommended, including mandating State - enabling legislation, providing financial support to local government, mandating municipal involvement, providing financing for conservation and alternative production, requiring uniform data collection, and preserving the multifamily housing stock. Municipal energy experiences in Franklin County, Mass., Hartford, Conn., Paterson, N.J., and Portland, Maine, and a list of municipal assistance resource agencies are appended.

PB82-144635 PC **A11**/MF **A01**
Real Estate Research Corp., Chicago, IL.
Marketing and Market Acceptance Data From the Residential Solar Demonstration Program: 1980. Volume 1: Detailed Analysis.
1980, 229p HUD-0002073
Contract HUD-H-2372

Solar homes were inspected and builders, buyers, and institutions involved in solar homes were interviewed to gather information about the marketability and acceptance of active residential solar energy. The study was conducted as part of the HUD Residential Solar Heating and Cooling Demonstration Program, which was designed to promote the development of a self - sustaining solar energy industry. Study participants include 138 builders, 276 buyers, and lending officers, municipal and county officials, utility representatives, and insurance agents involved with solar homes, as well as similar respondents involved with conventional homes. About 85 percent of the builders questioned expressed satisfaction with their experience in the demonstration program. Their sales experience has been largely successful and their costs recoverable. They also like the minimal red tape and construction problems encountered in solar home building and the promotional and publicity advantages of the solar home. Houses constructed in the demonstration program are similar in style and offer the same amenities and features as new conventional housing in the same areas. Solar homebuyers are concerned mainly with such traditional home values as product quality and effective market location. Purchasers closely resemble buyers of similarly priced conventional houses and do not consider the solar energy system as the only or most important factor in the purchase decision. Interviews with institutional representatives reveal few existing financial, administrative, or legislative impediments to residential solar application. Insurance companies currently do not differentiate between solar and conventional homes and are mainly concerned that the system be properly constructed and installed. Findings strongly indicate that residential solar energy is being accepted in the marketplace. Figures, tables, footnotes, and a map are included. (Author abstract modified).

PB82-144643 PC **A20**/MF **A01**
Real Estate Research Corp., Chicago, IL.
Marketing and Market Acceptance Data From the Residential Solar Demonstration Program: 1980. Volume 2: Technical Appendix.
1980, 465p HUD-0002074
Contract HUD-H-2372

This technical appendix to a study on the marketability of acceptance of active residential solar energy explains the structure of the HUD demonstration program, data collection methods, the survey instruments, and the limitations of the detailed analysis. It also presents in detail the study data. The study was conducted as part of the HUD Residential Solar Heating and Cooling Demonstration Program, which was designed to promote the development of a self - sustaining solar energy industry. Study data were gathered via inspection of solar homes and interviews with 138 builders, 276 buyers, and lending officers,gmunicipal and county officials, utility representatives, and insurance agents.1For purposes of comparison interviews were also conducted with builders, buyers, and institutions involved with conventional homes. Extensive tables present the responses to each of the study's questions.

PB82-144692 MF **A01**
Department of Housing and Urban Development, Washington, DC.
Intermediate Minimum Property Standards for Solar Heating and Domestic Hot Water Systems. Volume 5.
1977, 296p HUD-0002085
Paper copy available from Supt. of Docs., Washington, DC 20402.

These standards on solar heating and domestic hot water systems have been prepared as a supplement to the Minimum Property Standards (MPS) and deal only with aspects of planning and design that are different from conventional housing because of the solar systems under consideration. The document contains standards and requirements applicable to one - family and two - family dwellings, multifamily housing, and nursing homes and intermediate care facilities. The text's references to the MPS refer to the same section in the 'Minimum Property Standards for One - and Two - Family Dwellings,' and related documents. Generally, the chapters and divisions are organized to parallel the chapters and divisions contained in the MPS. Within divisions, however, these standards list the solar topic sequentially; they do not follow the numbering of the MPS. Commentaries on certain standards are included to give further explanation and guidance to users with respect to solar installation. Technical data, definitions, abbreviations, referenced standards, and graphic illustrations of terms used in the standards are appended. (Author abstract modified).

PB82-802729 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Flat Plate Solar Collector Design and Performance. 1976-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1976-Nov 81.
Dec 81, 248p
Supersedes PB80-814130, and NTIS/PS-79/0928.

Federally-funded research on the design and thermal efficiency of air- and liquid-type flat plate collectors is discussed. Topic areas cover convection characteristics, methods to reduce heat loss, optical coatings, and corrosion control. Emphasis of the bibliography is on basic research studies. (This updated bibliography contains 240 citations, 44 of which are new entries to the previous edition.)

PB82-802869 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Solar Ponds. 1976-November, 1981 (Citations from the NTIS Data Base).
Dec 81, 82p
Supersedes PB80-814460, and NTIS/PS-79/0924.

Federally-funded research on the design, performance, and use of solar ponds is discussed. Topic areas cover the use of solar ponds in industrial process heat production, roof ponds for passive solar buildings, and solar pond use in the production of biomass for renewable fuels. (This updated bibliography contains 74 citations, 25 of which are new entries to the previous edition.)

PB82-859737 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Economic Analysis of Ocean Thermal and Wind Power Plants and Power Generation. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jan 72-Dec 81.
Dec 81, 212p
Supersedes PB81-856478. Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography covers economic analyses and evaluations of techniques and technology for ocean thermal energy and small and large wind energy conversion systems and apparatus. Government policies and economic incentives to commercialization world-wide are cited, along with considerations of economic prospects and feasibility. (This updated bibliography contains 219 citations, 154 of which are new entries to the previous edition.)

10B. Power Sources

AD-A107 056/4 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
GaAs Shallow-Homojunction Solar Cells on Ge-Coated Si Substrates.
Journal article,
Ronald P. Gale, Bor-Yeu Tsaur, Frances M. Davis, John C. Fan, and George W. Turner. 25 Mar 81, 4p
JA-5219, ESD-TR-81-266
Contract F19628-80-C-0002
Pub. in IEEE Electron Device Letters, vEDL-2 n7 p169-171 Jul 81.

No abstract available.

AD-A107 173/7 PC **A09**/MF **A01**
New England River Basins Commission, Boston, MA.
Water, Watts, and Wilds Hydropower and Competing Uses in New England.
Final rept.
Aug 81, 186p
Original contains color plates: All DTIC and NTIS reproductions will be in black and white. Includes envelope with maps.

This report concludes a three year Hydropower Expansion Study conducted by the New England River Basins Commission. Basic objectives of the study were: to assess the feasibility of developing hydropower facilities at existing dams and undeveloped sites throughout the New England region; to clarify competing use issues which arise from the competition between hydropower development and other uses of water resources, and to assess the likelihood that conflicts would arise from such competition; and to provide information and data which will facilitate either the avoidance or resolution of competing use conflicts. The key findings from the study are summarized.

AD-A107 378/2 PC **A03**/MF **A01**
Coast Guard Research and Development Center, Groton, CT.
Accelerated Stress Testing of Solar Photovoltaic Modules.
Interim rept.,
S. E. Trenchard. Sep 81, 29p CGR/DC-25/81, USCG-D-59-81

In 1974, the U.S. Coast Guard began investigating solar photovoltaic arrays as power sources for marine aids to navigation. Initially, 53 systems consisting of a solar array, battery, and a flashing lamp load were placed in a rooftop test facility adjacent to Long Island Sound in Groton, CT. Within two years, the solar arrays of 25 systems had no power output thereby indicating failure. Effects of the marine environment were judged

to be responsible for the failures. In order to use solar arrays on operational aids to navigation, much greater reliability was essential. Consequently, development work was initiated on an accelerated stress test system that would rapidly identify solar photovoltaic modules capable of surviving in the marine environment. This interim report traces the history of accelerated stress testing of solar photovoltaic modules carried out at the U.S. Coast Guard R&D Center. It describes the military standard tests to which the prototype modules were exposed to and the results of that exposure. The report traces the evolution of the simultaneous multiple stress test to the present marine environment screening test. The results of exposure to the marine environment screening test of 136 test modules are reported. (Author)

AD-A107 513/4 PC **A06**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Annapolis, MD. Propulsion and Auxiliary Systems Dept.
Active Superconductive Generator Development 400-Horsepower Generator Design.
Research and development rept.,
Howard O. Stevens, and Michael J. Cannell. Oct 81, 119p Rept no. DTNSRDC/PAS-81/14

A superconductive acyclic generator has been designed and constructed using the unique current-carrying capabilities of superconducting wire in the field winding to produce a very high flux density in the rotor region. This, along with the use of liquid-metal current collectors in lieu of conventional brushes has yielded a very high power density machine designed to operate at gas turbine speeds. The nominal 300-kilowatt generator is 0.66 meter long and 0.46 meter in diameter (26 x 18 inches) and is designed to operate at 19,500 revolutions per minute. Extrapolation of the design analyses indicates no barriers to operation up to 750 kilowatts. Efficiencies of 98% are estimated over the practical operating range.

DE81023095 PC **A10**/MF **A01**
Montana Energy and MHD Research and Development Inst., Inc., Butte.
High-Temperature Fuel Cell Research and Development. Final Technical Status Report, June 1977-September 1978.
J. J. Rasmussen, R. Guidotti, and P. Lessing. 15 Oct 78, 218p DOE/ET/11320-T6
Contract AC02-77ET11320

An initial survey of the literature produced a list of ceramic materials (other than lithium aluminate) with properties which made them potential candidates for use in molten-carbonate fuel cell tiles or electrodes. Seven of the materials in the original list were dropped from consideration because of unfavorable thermodynamic properties; four materials were set aside because of high cost, lack of availability, or fabrication difficulties. Thirteen compositions were tested statically at 1000 K in a Li sub 2 CO sub 3 -K sub 2 CO sub 3 bath under a dry CO sub 2 atmosphere. Only four of the materials tested showed severe degradation reactions in the molten carbonate. A low-temperature process for forming small diameter, high-aspect ratio ceramic fibers for fuel cell use has been developed. A short-term program to initiate a computer study on the thermodynamic analysis of fuel cell materials was initiated at Montana State University. The MHD and high-temperature fuel cell literature was surveyed, and material properties were evaluated to identify MHD materials with potential use for fuel cell applications. A technology transfer report of these findings was prepared. Laboratory facilities were established to conduct research on interfacial diffusion processes which could be detrimental to successful long-term operation of the solid-electrolyte fuel cell. A variety of physical and chemical techniques were examined for the preparation of high-density substituted LaCrO sub 3 which was to be one component of a diffusion coupled with Y sub 2 O sub 3 -stabilized ZrO sub 2 . Hydrolysis of a mixed metal-nitrate solution with urea produced the most reactive powder. A final theoretical density of almost 98% was attained in cold-pressed sintered discs of this material. (ERA citation 06:035004)

DE81024188 PC **A05**/MF **A01**
General Atomic Co., San Diego, CA.
Line-Focus Solar-Central Power Systems. Second Quarterly Review.
10 May 79, 90p DOE/ET/20535-T3
Contract AC03-78ET20535

Progress with a slat-type line-focus solar central power system is reviewed with the use of numerous outlines and diagrams. Fabrication concepts for the primary concentrator, design requirements, and costs are presented. Each concentrator is fixed with a tracking receiver at the focus. The design of the heat receiver, including the linkage support, is given. Progress with the heat transfer and electric power generating systems is presented also. Subsystem parametric analyses are outlined for the collector, receiver, heat transport, power, energy storage, and master control subsystems, and system characterization studies are presented, including preliminary cost estimates. (ERA citation 06:034542)

DE81024236 PC **A04**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Thermoelectric Generator Testing and RTG Degradation Mechanisms Evaluation. Progress Report No. 36.
A. Lockwood, and V. Shields. Jul 80, 51p DOE/ET/33062-T4
Contract AI03-79ET33062

The n-type selenide legs after 15,000 hours continue to show reasonable agreement with the 3M Co. published thermal conductivity data. In the ingradient testing after 16,500 hours the 3 surviving n-legs (out of 5) show serious degradation in power to load. Weight loss and thermoelectricity property measurements on the first samples of material produced by G.E. continue to correspond to the results previously obtained on R.C.A. material from the MHW program. The remaining MHW generator on test, Q1-A, has accumulated 23,679 hours and performance remains stable. The 18 couple modules S/N-1 and -3 previously tested at RCA show no significant change in operation during the current JPL testing. A comparison of LES 8/9 RTG's with an improved version of DEGRA is shown. No changes in the trends of degradation of LES 8 and 9 and the Voyager RTGs have been observed. (ERA citation 06:035003)

DE81024237 PC **A04**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Thermoelectric Generator Testing and RTG Degradation Mechanisms Evaluation. Progress Report No. 37.
A. Lockwood, and V. Shields. Sep 80, 60p DOE/ET/33062-T3
Contract AI03-79ET33062

The n-type selenide legs after 16,500 hours continue to show reasonable agreement with the 3M Co. published thermal conductivity data. In the ingradient testing after 17,000 hours the 3 surviving n-legs (out of 5) show serious degradation in power to load. Small scale ratcheting has been observed on the four p-legs but no large scale effects. Weight loss for both coated and uncoated material produced by G.E. are reported. No significant discrepancies with the results previously obtained on R.C.A. material from the MHW program have been found. Thermal conductivity measurements are also in agreement. The remaining MHW generator on test, Q1-A, has accumulated 25,600 hours and performance remains stable. The 18 couple modules S/N-1 and -3 previously tested at RCA show no significant change in operation during the current JPL testing. No changes in the trends of degradation of LES 8 and 9 and the Voyager RTGs have been observed. (ERA citation 06:035002)

DE81027410 PC **A03**/MF **A01**
Energy and Environmental Analysis, Inc., Arlington, VA.
Programmatic Environmental Assessment Wind-Energy-Conversion Systems (WEC) Program. Issues-Identification Report.
2 Mar 79, 30p DOE/ET/20510-T2
Contract AC03-78ET20510

This report briefly describes environmental issues that may be associated with deployment of wind energy conversion systems (WECS). It is expected that these issues will be further elaborated and qualified to form the core of the impacts section of the WECS programmatic EA. However, the identified issues may be modified or refined and new issues added as analytical efforts continue and new information develops. (ERA citation 06:034669)

DE81030274 PC **A03**/MF **A01**
Joint Center for Graduate Study, Richland, WA.
Investigation of Solar Cells Base on Cu sub 2 O. Final Progress Report, June 1, 1980-May 31, 1981.
L. C. Olsen. Jul 81, 50p SERI/TR-9190-1-T3
Contract AC02-77CH00178

Investigations of Cu sub 2 O solar cells concentrated on junction fabrication. In particular, studies were carried out with the objective of determining if it is possible to fabricate a Cu sub 2 O junction with a built-in voltage significantly greater than 1 eV. Low level efforts were devoted to Cu sub 2 O substrate fabrication and characterization, and n-type film studies for Cu sub 2 O hetero-junctions. A Cu sub 2 O cell structure based on a Ti/Cu sub 2 O Schottky barrier was selected for a detailed study. Dark I-V analyses were carried out for thick film Ti/Cu sub 2 O Schottky barriers as a function of temperature. Concentration profiles were obtained for Ti/Cu sub 2 O structures with Auger Spectroscopy. (ERA citation 06:034530)

DE81030882 PC **A12**/MF **A01**
Avco-Everett Research Lab., Inc., Everett, MA.
Conceptual Design Study of Potential Early Commercial MHD Powerplant. Final Report of Task 2 Results.
F. A. Hals. Mar 81, 256p DOE/NASA/0051-2, NASA/CR-165235
Contract AI01-77ET10769

The first phase (Task I) of the program consisted of parametric analysis of three different reference power plants. This second phase (Task II) consisted of the conceptual design of one of the reference plants analyzed in Task I. This power plant was identified as attractive and selected for further study in Task II on the basic of Task I results. It employs oxygen enrichment of the combustion air and preheating of this oxygen enriched air to an intermediate temperature of 1200 exp 0 F attainable with a tubular type recuperative heat exchanger. The plant has a nominal plant capacity of 950 MW/sub e/. Conceptual designs of plant components and equipment with performance, operational characteristics and costs are reported. Plant economics and overall performance including full and part load operation are reviewed. Performance analysis showed that a net plant efficiency of 43.9% is attained at nominal load. The projected performance and estimated costs of this early MHD plant are shown to be attractive compared to conventional power plants, although it does not offer the same high efficiency and low cost as the mature MHD power plant considered in ECAS. Environmental aspects and the methods incorporated in plant design for emission control of sulfur and nitrogen are reviewed. Results from reliability/availability analysis conducted are also included. (ERA citation 06:033435)

DE81030975 PC **A03**/MF **A01**
Prototech Co., Newton Highlands, MA.
Energy Savings by Means of Fuel-Cell Electrodes in Electro-Chemical Industries. Progress Report, February 1, 1981-April 30, 1981.
A. Bar-Ilan, W. Juda, and B. P. Finnigan. 31 Jul 81, 26p DOE/ET/25309-T1, COO-4881-31
Contract AC02-78ET25309

Life testing of palladium-loaded and low platinum-loaded anodes on type C supports and with type no. 01 current collectors was continued and terminated. Additional life-test data are reported for high Pt-loaded and a second low Pt-loaded anode. The 6 in. x 6 in. depth cell has been operated at reduced hydrogen back pressures, and the effect of the resulting flooding of the hydrogen chamber upon cell performance has been determined. Furthermore, two 6 in. x 6 in. depth cells were fabricated from the same type platinum support and current collector, but following different preparation procedures. Cell performance was compared at various submergence depths under identical operating conditions. In view of their attractive cost/performance characteristics, two groups of type C/sub alpha / platinum anodes were prepared and tested in zinc electrowinning cells. Finally, a 1 ft. x 1 ft. cell module was designed and constructed, along with a 3 ft. x 3 ft. electrolyte chamber in which the cell will be tested at various depths. (ERA citation 06:035088)

DE81031934 PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Intermediate Photovoltaic System Application Experiment Operational Performance: Executive Summary. Volume 1, for Newman Power Station, El Paso, TX.
Aug 81, 9p SAND-81-7100-V.1
Contract AC04-76DP00789

The following data are given for a 20 kWp photovoltaic flat panel power system for an uninterruptable power supply load: total electrical energy produced during the month of June 1981, and for each day of the month; total incident solar energy in the plane of the collector during the month and for each day of the month; array efficiency; and monthly average direct normal insolation during the month during daylight hours. (ERA citation 06:034540)

DE81031936 PC **A03**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Possible Effects of Government and Industry Standards on Photovoltaic Products Liability.
M. Eisenstadt. Aug 81, 34p SAND-81-7034
Contract AC04-76DP00789

Products liability law is becoming more favorable toward the defendant, after two decades in the opposite direction. Industry and government standards and regulations can affect liability lawsuits involving producers and sellers of photovoltaic (PV) equipment. Design and fabrication in accordance with such standards are admissable as evidence, but does not determine legal issues. In some states, compliance is presumption that ordinary care was used and that the product is not defective or unreasonably dangerous. Good standards can aid in litigation in at least three ways: (1) they indicate that an industry is making a good-faith effort to police itself, creating a positive image of the defendant; (2) although they tend to be considered minimums for product safety and the courts are not obligated to accept them as adequate, they do provide guidance; this is particularly important for completely new products; and (3) perhaps most important, standards are one element in determining if a product complies with the state of the art, which in some states, can be used as a defense. (ERA citation 06:034502)

DE82000093 PC **A04**/MF **A01**
Westinghouse Electric Corp., Pittsburgh, PA. Advanced Energy Systems Div.
Module Experimental Process System Development Unit (MEPSDU). Quarterly Report No. 3, June 1, 1981-August 31, 1981.
1981, 70p DOE/JPL/955909-81/3
Contract NAS-7-100-955909

The performance evaluation of the module experimental process system development unit (MEPSDU) module is summarized. Hailstone impact, wind loading, thermal cycling and humidity cycling tests are reported, as well as tests on cell response to interconnect failure and to short circuit/shading. Investigations of four alternate process steps - electroless nickel metallization, ion implantation, liquid precursor films for diffusion masks and dopants, and plasma etching of raw web - are discussed. The design of the development unit is described. Photovoltaic module production costs were projected for 1 MW/yr and 25 MW/yr production lines. Progress on the automated cell interconnect station is reported. (ERA citation 06:034519)

DE82000173 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Fuel-Cell Applied Research: Electrocatalysis and Materials. Quarterly Report, October 1, 1980-December 31, 1980.
W. E. O'Grady, J. McBreen, H. S. Isaacs, H. Olender, and J. Hughes. 12p BNL-51429
Contract AC02-76CH00016

In this program, work is being carried out on four tasks: (1) effects of temperature and phosphoric acid concentration on oxygen reduction kinetics; (2) oxygen reduction kinetics in alternate acid electrolytes; (3) electrochemical surface science studies; and (4) organic oxidation reactions. Progress is summarized. (ERA citation 06:035009)

DE82000415 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Design and Assembly Considerations for Redox Cells and Stacks.
D. K. Stalnaker, and A. Lieberman. Sep 81, 12p
DOE/NASA/12726-10
Contract AI04-80AL12726

Individual Redox flow cells are arranged electrically in series and hydraulically in parallel to form a single assembly called a stack. The hardware currently being tested in the laboratory has an active electrode area of either 310 cm exp 2 (0.33 ft exp 2) or 929 cm exp 2 (1 ft exp 2). Four 310 cm exp 2 (0.33 ft exp 2) stacks, each consisting of 39 active cells, have been incorporated into a 1.0 kW preprototype system. The physical design of the stack is very critical to the performance and efficiency of the Redox storage system. The mechanical aspects of the cell and stack design for the current Redox hardware, with regard to sealing the stack internally as well as externally, minimizing shunt currents and minimizing the electrical resistance of the stack are described. (ERA citation 06:035006)

DOE/RA/11025-T1(V.1) PC **A11**/MF **A01**
Institute for Water Resources (Army), Fort Belvoir, VA.
National Hydroelectric Power Resources Study. Preliminary Inventory of Hydropower Resources. Volume 1. Pacific Northwest Region.
Jul 79, 241p
Contract AI01-77RA11025

The preliminary inventory and analysis procedures provide a comprehensive assessment of the undeveloped hydroelectric power potential in the US and determines which sites merit more thorough investigation. Over 5400 existing structures have been identified as having the physical potential to add hydropower plants or increase hydropower output thereby increasing our present hydropower capacity from a total of 64,000 MW to 158,000 MW and our energy from 280,000 GWH to 503,000 GWH. While the physical potential for this increase is clearly available, some of these projects will undoubtedly not satisfy more-detailed economic analysis as well as the institutional and environmental criteria which will be imposed upon them. Summary tables include estimates of the potential capacity and energy at each site in the inventory. In some cases, individual projects may be site alternatives to others in the same general location, when only one can be considered for hydropower development. The number of sites per state is identified, but specific information is included for only the sites in Alaska, Idaho, Oregon, and Washington in this first volume. (ERA citation 05:033369)

LBL-9438 PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Ocean Thermal Energy Conversion Preliminary Data Report for the February 1978 GOTEC-03 Cruise to the Gulf of Mexico, Mobile Site.
Jun 80, 34p
Contract W-7405-ENG-48

Preliminary physical, chemical, and biological data obtained on the GOTEC-03 cruise in February 27 to March 3, 1978 to the Mobile Site near 29 exp 0 N, 88 exp 0 W are presented in tabular and graphic form. The physical and chemical data consists of salinities and dissolved oxygens derived from water samples and temperatures from XBT's. The biological data includes biomass indicators (chlorophyll a, phaeophytin, and adenosine triphosphate), and zooplankton samples. The XBT and other physical data including current data collected on the GOTEC-03 cruise are reported elsewhere in Molinari, Hazelworth, and Ortman. (ERA citation 05:031874)

NCEI-0018 PC **A10**/MF **A01**
Research Triangle Inst., Research Triangle Park, NC. Applied Ecology Dept.
Support Services for Commercialization of Small Hydroelectric Facilities in North Carolina.
J. L. Warren. Jun 80, 203p RTI-1671/01-02F

Small hydro is defined as those hydroelectric resources available at existing sites with a potential capacity of less than 25,000 kW, or 25 MW. There is no limitation on the height of the dam. North Carolina has between 3000 and 4000 dams. Section II reviews the assessment of the small hydro resource available in North Carolina with different data sources. Section III details the assistance given to small hydro developers in North Carolina. Section IV summarizes recommendations for future activities in support of small hydro in North Carolina. Appendices include a list of existing and potential hydroelectric sites in North Carolina, a computerized list of power potentials at existing dams in North Carolina, a list of parties interested in small hydro, a sample letter sent to small hydro developers, and the program for a small hydro conference held in Asheville in 1979. (ERA citation 05:031739)

N82-11107/1 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Voltage Gradients in Solar Array Cavities as Possible Breakdown Sites in Spacecraft-Charging-Induced Discharges.
N. J. Stevens, H. E. Mills, and L. Orange. 1981, 10p
NASA-TM-82710, E-1003
Presented at the Ann. Conf. On Nucl. And Space Radiation Effects, Seattle, 21-24 Jul. 1981.

A possible explanation for environmentally-induced discharges on geosynchronous satellites exists in the electric fields formed in the cavities between solar cells - the small gaps formed by the cover slides, solar cells, metallic interconnects and insulating substrate. When exposed to a substorm environment, the cover slides become less negatively charged than the spacecraft ground. If the resultant electric field becomes large enough, then the interconnect could emit electrons (probably by field emission) which could be accelerated to space by the positive voltage on the covers. An experimental study was conducted using a small solar array segment in which the interconnect potential was controlled by a power supply while the cover slides were irradiated by monoenergetic electrons. It was found that discharges could be triggered when the interconnect potential became at least 500 volts negative with respect to the cover slides. Analytical modeling of satellites exposed to substorm environments indicates that such gradients are possible. Therefore, it appears that this trigger mechanism for discharges is possible.

N82-11544/5 PC **A06**/MF **A01**
Teledyne Brown Engineering, Huntsville, AL. Engineering Services Div.
Investigation of Direct Solar-to-Microwave Energy Conversion Techniques.
Final Report.
N. E. Chatterton, T. K. Mookherji, and P. K. Wunsch. Jan 78, 107p NASA-CR-161883, ESD-78-MSFC-2174
Contract NAS8-32643

Identification of alternative methods of producing microwave energy from solar radiation for purposes of directing power to the Earth from space is investigated. Specifically, methods of conversion of optical radiation into microwave radiation by the most direct means are investigated. Approaches based on demonstrated device functioning and basic phenomenologies are developed. There is no system concept developed, that is competitive with current baseline concepts. The most direct methods of conversion appear to require an initial step of production of coherent laser radiation. Other methods generally require production of electron streams for use in solid-state or cavity-oscillator systems. Further development is suggested to be worthwhile for suggested devices and on concepts utilizing a free-electron stream for the intraspace station power transport mechanism.

N82-11545/2 PC **A04**/MF **A01**
Stonehart Associates, Inc., Madison, CT.
Survey on Aging on Electrodes and Electrocatalysts in Phosphoric Acid Fuel Cells.
Progress Report.
P. Stonehart, and J. Hochmuth. Oct 81, 73p NASA-CR-165505, DOE/NASA/0176-81/3
Contract DEN3-176

The processes which contribute to the decay in performance of electrodes used in phosphoric acid fuel cell systems are discussed. Loss of catalytic surface area, corrosion of the carbon support, electrode structure degradation, electrolyte degradation, and impurities in the reactant streams are identified as the major areas for concern.

N82-11546/0 PC **A05**/MF **A01**
Spire Corp., Bedford, MA.
Processing of Silicon Solar Cells by Ion Implantation and Laser Annealing.
Final Report.
J. A. Minnucci, K. W. Matthei, and A. C. Greenwald. Feb 81, 78p NASA-CR-165283, FR-10066
Contract NAS3-21276

Methods to improve the radiation tolerance of silicon cells for spacecraft use are described. The major emphasis of the program was to reduce the process-induced carbon and oxygen impurities in the junction and base regions of the solar cell, and to measure the effect of reduced impurity levels on the radiation tolerance of cells. Substrates of 0.1, 1.0 and 10.0 ohm-cm float-zone material were used as starting material in

the process sequence. High-dose, low-energy ion implantation was used to form the junction in n+p structures. Implant annealing was performed by conventional furnace techniques and by pulsed laser and pulsed electron beam annealing. Cells were tested for radiation tolerance at Spire and NASA-LeRC. After irradiation by 1 MeV electrons to a fluence of 10 to the 16th power per sq cm, the cells tested at Spire showed no significant process induced variations in radiation tolerance. However, for cells tested at Lewis to a fluence of 10 to the 15th power per sq cm, ion-implanted cells annealed in vacuum by pulsed electron beam consistently showed the best radiation tolerance for all cell resistivities.

N82-11548/6 PC **A04**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
The Effects of Impurities on the Performance of Silicon Solar Cells.
K. A. Yamakawa. 1 Sep 81, 75p NASA-CR-164945, JPL-PUB-81-76
Contracts NAS7-100, EX-76-A-29-1012

The major factors that determine the tolerable concentrations of impurities in silicon feedstock for solar cells used in power generation are discussed in this report. It is concluded that a solar-grade silicon can be defined only for a specific manufacturing process. It is also concluded that it is the electrical effects, efficiency and resistivity, that are dominant in determining tolerable concentrations of impurities in the silicon feedstock. Crystal growth effects may become important when faster growth rates and larger crystal diameters are developed and used.

N82-11551/0 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Solar Cell Development for the Power Extension Package.
C. R. Baraona, and J. L. Cioni. 1981, 8p NASA-TM-82685, E-922
Presented at the 16TH Intersoc. Energy Conversion Conf., Atlanta, 9-14 Aug. 1981.

The PEP is a 32 kilowatt flexible substrate, retrievable, solar array system for use on the Space Shuttle. Solar cell costs will be reduced by increasing cell area and simplifying cell and coverglass fabrication processes and specifications. The cost goal is to produce cells below $30 per watt. Two and ten ohm-cm silicon cells were investigated. In phase I of the cell development program a few thousand candidate cells will be produced and evaluated for utility and quality. In phase II a large number of cells will be fabricated to verify production readiness and cell yields and costs. This schedule is compatible with PEP initial operational capability in 1984. Approximately 140,000 large area (5.9 x 5.9 cm) cells will be required for two PEP solar arrays. The status of the cell development and testing, including a radiation damage test and side-by-side comparison of candidate cell types with pre- and post-irradiation airplane calibration of outer space short-circuit current, is reported.

ORNL/SUB-7317/1 PC **A23**/MF **A01**
Stone and Webster Engineering Corp., New York.
Cogeneration Feasibility Study in the Gulf States Utilities Service Area.
Dec 79, 536p
Contract W-7405-ENG-26

Sites in the Gulf States Utilities service are considered for cogeneration feasibility studies. The sources of steam considered for the Orange, Texas and Geismar, Lake Charles, and North Baton Rouge, Louisiana sites include oil, coal, HTGR steamers, consolidated nuclear steam system, atmospheric fluidized-bed coal combustion, and coal gasification. Concepts concerning cogeneration fuel systems were categorized by technical applicability as: current technology (pulverized coal-fired boilers and fuel oil-fired boilers), advanced technology under development (HTGR steamers and the CNSS), and advanced technology for future development (atmospheric fluidized-bed boilers and coal gasification). In addition to providing data on cogeneration plant generally useful in the US, the study determined the technical and economic feasibility of steam and electric power cogeneration using coal and nuclear fuels for localized industrial complexes. Details on site selection, plant descriptions, cost estimates, economic analysis, and plant schedule and implementation. (ERA citation 05:013819)

ORNL/SUB-7317/2 PC **A09**/MF **A01**
Stone and Webster Engineering Corp., New York.
Cogeneration Institutional Study in the Geismar, LA, and Orange, Texas Areas.
Dec 78, 199p
Contract W-7405-ENG-26

The objective of this report is to provide a better understanding of the institutional problems involved in the use of coal-fueled cogeneration. The viewpoints of industry, utilities, and government were probed extensively through indepth confidential interviews. To provide a real-life basis for this investigation, two existing industrial sites in the Gulf Coast area were studied. The projected effects of the installation of coal-burning cogeneration plants supplying steam and electricity to several industries, replacing existing oil and gas burning boilers, were studied for each site. This report provides insights into the overall institutional problem that will be useful at other locations. It covers the regulatory, economic, financial, engineering, operating, contractual, and corporate relations aspects of cogeneration. It concludes with suggestions for future action by the Federal government, state governments, industries, and utilities that should be helpful in removing the institutional constraints that are retarding cogeneration installations and the use of coal. (ERA citation 05:013820)

ORNL/TM-6626/V1 PC **A09**/MF **A01**
Oak Ridge National Lab., TN.
Assessment of an Atmospheric Fluidized-Bed Coal-Combustion Gas-Turbine Cogeneration System for Industrial Application.
R. L. Graves, R. S. Holcomb, and J. R. Tallackson.
Oct 79, 182p
Contract W-7405-ENG-26

This study was initiated to provide information on the future potential industrial market for a cogeneration system consisting of a fluidized-bed coal combustor coupled to a gas-turbine (Brayton cycle) power system that uses air as the working fluid. In assessing the potential applications for the system, the process heat energy consumption by industry is identified, with special detail included on the six most energy-intensive industries. The potential impact on the nation's oil and natural gas consumption that would result from widespread utilization of coal for process heat is also estimated. The fraction of industrial process heat that the system could feasibly satisfy from a thermodynamic viewpoint is estimated, and the performance (potential fuel efficiency and heat/power ratio) of the atmospheric fluidized-bed gas-turbine system is calculated. Also treated are several specific case studies of industries in which the system could be incorporated. Major parameters are specified, and flow sheets are derived for systems that would satisfy the heat and power requirements of the process or industry. The overall fuel utilization efficiency, thermal power rating, and potential number of installations are specified for these case studies. The findings of the study indicate that there is a sizable potential market for the system, with over 1000 possible installations disclosed after reviewing only 8 specific industries from 6 major Standard Industrial Classification (SIC) groups. The potential displacement of oil and gas by coal in process heating is shown to be about 1.60 m exp 3 /sec (870,000 bbl/d) of oil and 4590 m exp 3 /sec (14.0 billion ft exp 3 /d) of natural gas for all industries combined. Continued development of the fluidized-bed coal combustor and power system is recommended so that this potential may be at least partially realized. (ERA citation 05:004470)

ORNL/TM-7003 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Molten Carbonate Fuel Cell Program. Progress Report for Period January 1-March 31, 1979: EMF And Temperature Relaxation in LiKCO sub 3 Tiles; Transference Cell Measurements.
J. Braunstein, H. R. Bronstein, A. R. Manner, J. Nwalor, and D. H. Smith. Dec 79, 22p
Contract W-7405-ENG-26

Progress has been made in resolving the thermoelectric contributions to the relaxing EMF of electrolyzed LiKCO sub 3 -LiAlO sub 2 tiles in a study of mass transport in molten carbonate fuel cell electrolytes. The thermoelectric effect is a measurable contribution, but only in the early stages of the relaxation that we have attributed to diffusion. Preliminary measurements with the transference EMF cell are reported along with estimates of the transference number in LiKCO sub 3 . (ERA citation 05:007302)

PB82-136987 PC **A04**/MF **A01**
Aeronautical Research Inst. of Sweden, Stockholm.
A Two-Dimensional Study of the Maximum Power That Can Be Obtained from a Wind Turbine in a Wind Shear Layer,
Bo C. A. Johansson. Apr 81, 62p FFA-134

In 1926 Albert Betz derived a one-dimensional stream tube theory for the maximum power that can be obtained from a wind turbine in a uniform flow. However, for modern large wind turbines there is a considerable velocity gradient in the approaching flow, since the wind flow field above the ground normally is a shear layer with a velocity profile reminding of that of a boundary layer of a wing or a flat plate. The present study extends Betz' theory to a two-dimensional case, where the undisturbed velocity field is given and allowed to vary arbitrarily vertically, and the location of the wind turbine is given. The maximum power is calculated by the method of calculus of variations. It is found that for common wind velocity profiles the maximum power is only slightly larger than the power, which is obtained by a constant relative wind speed retardation, equal to Betz' retardation, while for a linear velocity profile there is a considerable difference.

PB82-802828 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Fuel Cells. 1979-June, 1980 (Citations from the NTIS Data Base).
Dec 81, 145p

Fuel cell applications, components, fabrication, design, catalysts, and chemistry are covered. The bibliography includes different types of fuel cells, such as hydrogen-oxygen cells, hydrocarbon-air cells, and biochemical cells. (This updated bibliography contains 139 citations, none of which are new entries to the previous edition.)

PB82-802836 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Fuel Cells. 1980-November, 1981 (Citations from the NTIS Data Base).
Dec 81, 270p
Supersedes PB80-813397, and NTIS/PS-79/0717.

Fuel cell applications, components, fabrication, design, catalysts, and chemistry are covered. The bibliography includes different types of fuel cells, such as hydrogen-oxygen cells, hydrocarbon-air cells, and biochemical cells. (This updated bibliography contains 265 citations, all of which are new entries to the previous edition.)

10C. Energy Storage

AD-A107 354/3 PC **A03**/MF **A01**
Naval Surface Weapons Center, Silver Spring, MD.
Pore Size, Zinc Penetration, and Zinc Diffusion Studies on PPQ/CA Separators.
Research and development rept.,
Isaac Angres, and Wendy Parkhurst. 2 Feb 81, 38p
Rept no. NSWC/TR-80-319

Studies were performed of some properties of co-polymeric polyphenylquinoxaline/cellulose acetate (PPQ/CA-60/40) membranes that are candidate separator materials for secondary alkaline batteries. Pore size measurements were obtained by bubble pressure, mercury porosimetry and electron microscopy methods. Zinc penetration measurements and measurements of zinc ion diffusion through the membrane were obtained in aqueous potassium hydroxide media using standardized electrolysis methods. For comparison purposes, dendrite penetration and zinc diffusion measurements were also obtained for two conventional cellulosic separator materials. It was concluded that the methods chosen are valid and useful for assessing the quality of separator materials. It was also concluded that PPQ/CA-60/40 membranes compare favorably with conventional separator materials. (Author)

DE81027235 PC **A10**/MF **A01**
SRI International, Menlo Park, CA.

Temperature Limitations of Alkaline-Battery Electrodes. Part 1. The Electrochemical Kinetic Behavior of Iron, Nickel, and Zinc in Concentrated Sodium Hydroxide Solutions. Final Report.
M. C. H. McKubre, and D. D. Macdonald. Nov 79, 208p DOE/ET/25425-T1
Contract AC01-78ET25425

The electrochemical kinetic properties of the metals iron, nickel, and zinc have been studied in concentrated electrolyte, in the temperature range -20 exp 0 to 120 exp 0 C. Three electrolyte concentrations have been examined for iron and nickel, corresponding to 20, 24, and 28 wt % NaOH. Zinc has been studied in detail only in the highest concentration. The principal tools and methods used in this study were single and repetitive sweep voltammetry, potential step and potential sweep coulometry, and the use of rotating ring disk electrodes. From a comprehensive survey of the dependence of cyclic voltammagrams on the potential sweep rate, we have been able to document the kinetic limitations imposed by Ni and Fe electrodes as a function of temperature. The major temperature limitations found are associated principally with irreversible electrode reactions; electrode dissolution (Fe and Zn), electrolysis (Fe and Ni), and irreversible components of film growth (Fe and Ni). In addition, Zn was found to undergo a temperature-dependent passivation process, which results in current oscillation under high load conditions. (ERA citation 06:034929)

DE81030338 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Temperature and Concentration Transients in the Aluminum-Air Battery.
R. V. Homsy. 26 Aug 81, 22p UCRL-86648, CONF-811013-4
Contract W-7405-ENG-48
Electrochemical Society conference, Denver, CO, USA, 11 Oct 1981.

Coupled conservation equations of heat and mass transfer are solved, that predict temperature and concentration of the electrolyte of an aluminum-air battery system upon start-up and shutdown. Results of recent laboratory studies investigating the crystallization kinetics and solubility of the caustic-aluminate electrolyte system are used in the predictions. Temperature and concentration start-up transients are short, while during standby conditions, temperature increases to a maximum and decreases slowly. (ERA citation 06:034935)

LA-7885-MS(V.2) PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix A: Energy Storage Coil and Superconductor.
R. I. Schermer. Sep 79, 30p
Contract W-7405-ENG-36

The technical aspects of a 1-GWh Superconducting Magnetic Energy Storage (SMES) coil for use as a diurnal load-leveling device in an electric utility system are presented. The superconductor for the coil is analyzed, and costs for the entire coil are developed. (ERA citation 05:003084)

LA-7885-MS(V.3) PC **A02**/MF **A01**
Aluminum Co. of America, Pittsburgh, PA.
1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix B: Cost Study, High-Purity Aluminum Production.
C. N. Cochran, R. K. Dawless, and J. B. Whitchurch. Sep 79, 12p
Contract W-7405-ENG-36

Cost information is supplied for aluminum with purities of 200, 2000, and 5000 residual resistivity ratio. Two production situations were used for each purity: (1) 1 x 10 exp 6 kg/yr production rate with a 30-yr sustaining market and (2) 1 x 10 exp 6 kg/yr production rate for 2 yrs only. These productions and purities are of interest for manufacturing devices for Superconducting Magnetic Energy Storage. The cost study results are presented as a range and include (1) the selling price of the aluminum for each case, (2) the cost of facilities including construction, engineering, and related costs, (3) the cost of money and depreciation (interest/amortization), and (4) the energy costs - the total of power and fuel. The range is affected by possible production variations and other uncertainties. Information is also given on plant location options and the preferred feed to the purification facility (with ore source effects). (ERA citation 05:003085)

LA-7885-MS(V.5) PC **A02**/MF **A01**
Fenix and Scisson, Inc., Tulsa, OK.
1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix D: Superconductive Magnetic Energy Storage Cavern Construction Methods and Costs.
Sep 79, 16p
Contract W-7405-ENG-36

The excavation and preparation of an underground cavern to contain a 1-GWh diurnal load-leveling Superconducting Magnetic Energy Storage (SMES) unit is examined. The cavern's principal function is to provide a rock structure for supporting the magnetic forces from the charged storage coil. Certain economic considerations indicate the refrigerator cold box for the helium system should also be underground. The study includes such a provision and considers, among other things, rock bolting, water seepage, concrete lining of the walls, steel bearing pads, a system to prevent freezing of the walls, a mining schedule, and costs. (ERA citation 05:003086)

LA-7885-MS(V.7) PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix F. 1-GWh Electrical System Design.
H. J. Boenig. Sep 79, 22p
Contract W-7405-ENG-36

Two circuit configurations for reducing the installed converter power and cost of high-power converter systems that operate in a constant-power mode over a wide current and voltage range are suggested and analyzed. (ERA citation 05:004531)

LMSC-D-683375 PC **A08**/MF **A01**
Lockheed Palo Alto Research Labs., CA.
Reactive Metal-Air Batteries for Automotive Propulsion. Final Report, August 1, 1978-November 30, 1979.
W. R. Momyer, and J. L. Morris. 20 Dec 79, 174p
Contract ET-78-C-03-1872

Lithium-water-air (Li-H sub 2 O-air) cells with electrode areas of 500 cm exp 2 were discharged in an acrylic cell casing designed specifically for this purpose. Numerous cells were discharged in lithium hydroxide (LiOH) electrolyte at an electrolyte temperature near 25 exp 0 C. Power output was regulated by controlling the LiOH concentration in the electrolyte. The cells were normally discharged at voltages from 2.0 to 2.3 V and current densities ranging from 50 to 200 mA/cm exp 2 . The design power density of 0.4 W/cm exp 2 was achieved at Li current efficiencies near 90 percent by the conclusion of the test program. The Li-H sub 2 O-air electrochemical couple does not appear to exhibit any significant scaling factor in regard to either electrode area or the number of cells in the battery. A detailed investigation was carried out to determine the applicability of the aluminum-water-air (Al-H sub 2 O-air) cell concept as a power source for automotive propulsion. The characteristics of various candidate Al alloys were determined in both laboratory half-cell corrosion studies and full-cell discharge studies. Examination of the effect of variations in operational parameters of a subscale 50-cm exp 2 cell was accomplished, and the critical parameters were identified. Evaluation of candidate air cathodes from several sources was undertaken. Cathodes from only two sources were found to have adequate polarization characteristics; of these, only one possessed the durability desired for automotive applications. For a full cell, peak power density of 378 mW/cm exp 2 at 425 mA/cm exp 2 was obtained. At a nominal useful voltage of 1.3 V, the power density was 230 mW/cm exp 2 at 175 mA/cm exp 2 . Coulombic efficiencies of 90 percent were obtained. 48 figures, 9 tables. (ERA citation 05:030734)

NE-PROJ-2060591(Pt.1) PC **A05**/MF **A01**
Vattenbyggnadsbyraan, Stockholm (Sweden).
Heat Storage in Ground Water. Part 1. Study of Ground Water Reservoirs.
Jan 80, 91p
In Swedish.
U.S. Sales Only.

The possibilities to use industrial waste heat, available during the summer season, for space heating in Klippan, southern Sweden were examined, in particular, a project including seasonal heat storage in a groundwater reservoir. It was determined that 6 to 7 GWh could be stored at a water temperature of 15 to 30 exp 0 C. Hydraulic and thermal measurements of reservoirs are reported. Systems for distribution of low-temperature heat are discussed. Further field measurements are necessary before any decisions are made. (ERA citation 05:019030)

NE-PROJ-2060591(Pt.2) PC **A04**/MF **A01**
Vattenbyggnadsbyraan, Stockholm (Sweden).
Heat Storage in Ground Water. Part 2. Study of Distribution Systems.
Jan 80, 51p
In Swedish.
U.S. Sales Only.

Suggestions are made for design of a district-heating system in a small town in southern Sweden. Waste heat produced during summertime in a local industry can be seasonally stored in a ground water aquifer, and used as a source for heat pumps in wintertime. This report discusses the total economy of the project and makes comparisons with more-conventional systems. (ERA citation 05:019031)

PB82-134156 PC **A02**/MF **A01**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Heat Energy Recovery from Domestic Output Fluids (HERDOF),
F. M. Russell. c1981, 15p RL-81-074

A device incorporating energy storage is described which permits recovery of part of the available heat energy in domestic output fluids. Preliminary estimates of the potential savings indicate the device should be examined in depth and practical tests conducted. The attitude of industry to the proposed device has been considered and positive recommendations are made in that area. (Copyright (c) Science and Engineering Research Council 1981.)

PB82-137589 PC **E06**/MF **E06**
Commission of the European Communities, Luxembourg.
Thermal Energy Storage Systems. Part I.
Final rept.,
P. W. O'Callaghan, I. E. Smith, S. D. Probert, and M. A. Bell. c1981, 143p EUR-7266-EN
Prepared in cooperation with Cranfield Inst. of Tech. (England).
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Research into the use of saturated-solutions of inorganic salts for thermal energy storage has shown that energy densities of between 2 and 4 times that of thermal storage in water are attainable over the temperature interval 30C to 70C. The operation of a viable storage device depends on the ability to remove heat from the hot solution without supercooling and without fouling the heat exchanger. Two types of heat exchanger effectively fulfilled these requirements: one used a fluidized bed of coarse particles, the other was continuously mechanically cleaned. A small sized (46 liter) thermal store was constructed and tested. It showed a high degree of stratification and good agreement with predictions from a mathematical model. It appears to offer scope for development in terms of thermal performance, reliability, and cost.

PB82-802760 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Lead Batteries. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 299p
Supersedes PB80-813363, and NTIS/PS-79/0780.

The design, development, components, fabrication, chemistry, and testing of lead batteries are cited in this compilation of Federally-funded research. Specific applications for spacecraft, consumer products, and electric vehicles are covered. Studies on lead recovery from battery scrap are covered. Several abstracts on lead toxicity in industrial plants are also cited. (This up-

dated bibliography contains 292 citations, 93 of which are new entries to the previous edition.)

PB82-859091 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Thermal Energy Storage: Glauber's Salt. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 87p
Supersedes PB81-852774. Prepared in cooperation with the Department of Energy, Washington, DC.

The use of sodium sulfate decahydrate (Glauber Salt) as a heat transfer and storage medium is discussed. The integration of the storage system with passive solar heating is featured. Heat transfer studies for both solar heating and off-peak air conditioning are also included. (This updated bibliography contains 76 citations, 22 of which are new entries to the previous edition.)

11. MATERIALS

11A. Adhesives and Seals

N82-11183/2 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Universal Binding Energy Relations in Metallic Adhesion.
J. Ferrante, J. R. Smith, and J. H. Rose. 1981, 16p
NASA-TM-82706, E-993
Presented at the Conf. On Aspects Microscopiques de l'Adhesion et de le Lubrication, Paris, 14-18 Sep. 1981.

Scaling relations which map metallic adhesive binding energy onto a single universal binding energy curve are discussed in relation to adhesion, friction, and wear in metals. The scaling involved normalizing the energy to the maximum binding energy and normalizing distances by a suitable comination of Thomas-Fermi screening lengths. The universal curve was found to be accurately represented by E*(A*)= - (1+beta A) exp (-Beta A*) where E* is the normalized binding energy, A* is the normalized separation, and beta is the normalized decay constant. The calculated cohesive energies of potassium, barium, copper, molybdenum, and samarium were also found to scale by similar relations, suggesting that the universal relation may be more general than for the simple free electron metals.

PB82-856584 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Lubrication and Wear Resistance of Dynamic Seals. 1973-November, 1981 (Citations from the BHRA Fluid Engineering Data Base).
Rept. for Jan 73-Nov 81.
Dec 81, 161p

The performance of dynamic seals is discussed in the cited reports in terms of frictional forces, methods of lubrication, and wear resistance. Methods for testing and measuring frictional factors, lubricating film thickness, and abrasive wear are also discussed. Elastomeric and metal seals are included. (Contains 153 citations fully indexed and including a title list.)

PB82-859836 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Cold Setting Glue for Packaging. 1976-1981 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 103p

This bibliography contains citations on the use of cold-setting adhesives in the paperboard cartoning and packaging industry. Energy cost savings relative to the use of cold-setting glue over hot glues, equipment systems necessary for applying the cold adhesive, limitations of cold glue applications, hot-melt and cold-set adhesive contrast and comparison, cold-set glue compatibility with automatic sheet folder, and hot adhesive and cold glue compatibility in bottle labeling systems are among the relevant topics discussed. Performance evaluations of cold-setting glue for folded carbon manufacture are included. (Contains 60 citations fully indexed and including a title list.)

11B. Ceramics, Refractories, and Glasses

AD-A107 245/3 PC **A02**/MF **A01**
Massachusetts Univ., Amherst. Dept. of Mechanical Engineering.
Predicting Failure of Optical Glass Fibers.
Technical rept. 1 Oct 80-1 Oct 81,
John E. Ritter, Jr., and Karl Jakus. Oct 81, 14p
Contract N00014-78-C-0836

Factors that affect failure predictions of optical glass fibers in service were studied. These factors include the effect of various polymeric coatings on the fatigue behavior, dependency of long term fatigue predictions on the form of the subcritical crack velocity, and prediction of long-length strengths from strength data of short-length specimens. (Author)

AD-A107 333/7 PC **A03**/MF **A01**
Brown Univ., Providence, RI. Dept. of Chemistry.
Vibrational Spectra of Oxygen- and Boron-Isotopically Substituted B2O3 Glasses.
Technical rept.,
Charles F. Windisch, and William M. Risen, Jr. 15 Sep 81, 43p Rept no. TR-81-02
Contract N00014-75-C-0883

The Raman spectra of 10B, 11B, 16O, 18O, and mixed isotopic compositions of B2O3 (gl) are reported. The 808/cm band assigned to the boroxol ring structure is found to shift upon oxygen isotope substitution, and not to depend on the boron mass. It is replaced by four bands, in the intensity ratio 1:3:3:1, in the case of the 50% 16O-50% 18O-containing material. On the other hand, the frequencies other principal bands depend on the masses of both boron and oxygen. The ca 1260/cm band, in particular, depends on the masses of both, and shifts without broadening upon partial oxygen substitution. The analysis of these data shows that both a local unit, behaving as predicted for the boroxol ring, and a continuous random network of connecting bonds are manifested in the spectra. (Author)

AD-A107 501/9 PC **A04**/MF **A01**
Cambridge Univ. (England). Dept. of Metallurgy and Materials Science.
Microhardness, Friction and Wear of SiC and Si3N4 Materials as a Function of Load, Temperature and Environment.
Annual technical rept. no. 2, 1 Oct 79-30 Sep 80,
M. G. S. Naylor, and T. F. Page. Oct 80, 69p
Grant DA-ERO-78-G-010

Temperature - and load-variable microhardness tests have been used to study the changing incidence of plasticity and fracture in SiC, Si3N4 and Si materials as a function of specimen microstructure. The decrease of hardness with temperature was more marked for SiC than for Si3N4 materials, such that the room temperature superiority of SiC over most forms of Si3N4 (only PDSN (pyrolytically deposited Si3N4) has comparable room temperature hardness)) was not maintained above v approx. 600 C. The hardness/temperature curve for (111) single crystal Si was similar in form to those reported by previous workers. Microstructural influences on hardness were more pronounced in Si3N4 than in SiC. Grain boundaries were generally observed to cause softening, and often provided preferred fracture paths, especially in fine-grained materials and especially at high temperature (800 C). However, fracture toughness values were highest for fined-grained materials, probably due to crack deflection by grain boundaries.

AD-A107 522/5 PC **A11**/MF **A01**
Ford Motor Co., Dearborn, MI.
Brittle Materials Design, High Temperature Gas Turbine.
Final rept. 1 Jul 71-31 Aug 79,
Arthur F. McLean, and Eugene A. Fisher. Mar 81, 234p AMMRC-TR-81-14
Contract DAAG46-71-C-0162, DARPA Order-1849

Starting in July 1971, the Defense Advanced Research Projects Agency (DARPA) sponsored a joint program with the Ford Motor Company to demonstrate and encourage the use of brittle materials in engineering design. The program, which was to be a total systems iterative approach to high temperature structural design with ceramics in highly stressed applications focused on the development of ceramic components for gas turbine application. A goal of 200 hours of engine or engine rig demonstration for representative duty cycle temperatures in a regenerated vehicular gas turbine was chosen, with uncooled ceramic components to operate at least 25 hours at 2500 F, considerably beyond the temperatures possible with uncooled metal components. The total systems approach included major efforts in ceramic design, materials development, fabrication process development, fabrication process development, and test and evaluation methodology. Considerable progress was made in each of these areas during the course of the program. For example, the strength of reaction bonded silicon nitride (RBSN) used in the stator and rotor blades was more than tripled between July 1971 and July 1977.

DE81030130 PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Aqueous Dissolution of Calcium Metaphosphate Glasses.
B. C. Bunker. 1981, 9p CONF-810953-2
Contract AC04-76DP00656
JOWOG-12 conference, Aldermaston, UK, 21 Sep 1981.

A series of experiments was conducted to determine the kinetics and mechanisms of aqueous dissolution for a series of phosphate glasses having the mole % composition (50-X)M sub 2 O.XCaO.5OP sub 2 O sub 5 , where M is either Na or Li. 9 figures. (ERA citation 06:035248)

N82-11120/4 PC **A00**
National Aeronautics and Space Administration, Washington, DC.
Silicon Carbide as an Oxidation-Resistant High-Temperature Material. 1: Oxidation and Heat Corrosion Behavior.
J. Schlichting. Aug 81, 11p NASA-TM-76608
Contract NASW-3199
Transl. into English from Ber. Dtsche. Keram. Ges., (Germany, F.R.). V. 56, No. 8, 1979 p 196-200. Transl. By Kanner (Leo) Associates, Redwood City, Calif.

The oxidation and corrosion behavior of SiC (in the form of a SiC powder) and hot-pressed and reaction-bound material were studied. The excellent stability of SiC in an oxidizing atmosphere is due to the development of protective SiO2 coatings. Any changes in these protective layers (e.g., due to impurities, reaction with corrosive media, high porosity of SiC, etc.) lead in most cases to increased rates of oxidation and thus restrict the field of SiC application.

N82-11209/5 PC **A04**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Fracture Mechanics of Cellular Glass.
J. G. Zwissler, and M. A. Adams. 1 Feb 81, 53p
NASA-CR-164959, JPL-PUB-81-16
Contracts NAS7-100, DE-AI01-81ET-20307

The fracture mechanics of cellular glasses (for the structural substrate of mirrored glass for solar concentrator reflecting panels) are discussed. Commercial and developmental cellular glasses were tested and analyzed using standard testing techniques and models developed from linear fracture mechanics. Two models describing the fracture behavior of these materials were developed. Slow crack growth behavior in cellular glass was found to be more complex than that encountered in dense glasses or ceramics. The crack velocity was found to be strongly dependent upon water vapor transport to the tip of the moving crack. The existence of a static fatigue limit was not conclusively established, however, it is speculated that slow crack growth behavior in Region 1 may be slower, by orders of magnitude, than that found in dense glasses.

ORNL/TM-6970 PC **A06**/MF **A01**
Oak Ridge National Lab., TN.
Materials Analyses of Ceramics for Glass Furnace Recuperators.
G. W. Weber, and V. J. Tennery. Nov 79, 115p
Contract W-7405-ENG-26

The use of waste heat recuperation systems offers significant promise for meaningful energy conservation in the process heat industries. This report details the analysis of candidate ceramic recuperator materials exposed to simulated industrial glass furnace hot flue gas environments. Several candidate structural ceramic materials including various types of silicon carbide, several grades of alumina, mullite, cordierite, and silicon nitride were exposed to high-temperature flue gas atmospheres from specially constructed day tank furnaces. Furnace charging, operation, and batch composition were selected to closely simulate industrial practice. Material samples were exposed in flues both with and without glass batch in the furnace for times up to 116 d at temperatures from 1150 to 1550 exp 0 C (2100 to 2800 exp 0 F). Exposed materials were examined by optical microscopy, scanning electron microscopy, energy dispersive x-ray analysis, x-ray diffraction, and x-ray fluorescence to identify material degradation mechanisms. The materials observations were summarized as: Silicon carbide exhibited enhanced corrosion at lower temperatures (1150 exp 0 C) when alkalies were deposited on the carbide from the flue gas and less corrosion at higher temperatures (1550 exp 0 C) when alkalies were not deposited on the carbide; alumina corrosion depended strongly upon purity and density and alumina contents less than 99.8% were unsatisfactory above 1400 exp 0 C; and mullite and cordierite are generally unacceptable for application in soda-lime glass melting environments at temperatures above 1100 exp 0 C. (ERA citation 05:005926)

11C. Coating, Colorants, and Finishes

AD-A107 286/7 PC **A02**/MF **A01**
Army Armament Research and Development Command, Aberdeen Proving Ground, MD. Chemical Systems Lab.
Evaluation of Replacement Red Smoke Dyes for 1-N Methylaminoanthraquinone.
Technical rept. Nov 79-May 80,
Ellen S. Vigus, and Albert Deiner. Oct 81, 17p Rept no. ARCSL-TR-81054

A list of 114 dyes was compiled from a literature search for replacement red smoke dyes for 1-N methylaminoanthraquinone. Two of the dyes reviewed (9-diethylaminorosindone and O-methoxyphenylazo-B-naphthol) were found to meet the requirements for use in pyrotechnics. There are insufficient toxicological data at this time to assess the health effects of these dyes. (Author)

AD-A107 344/4 PC **A02**/MF **A01**
Army Materials and Mechanics Research Center, Watertown, MA.
Use of Titanium to Enhance Wetting of Reaction-Bonded Silicon Nitride by Silicon,
Donald R. Messier. 1980, 18p Rept no. AMMRC-TR-81-48
Pub. in Ceramic Engineering and Science Proceedings, v1 n7-8(B) p624-633 Jul-Aug 80.

No abstract available.

PAT-APPL-6-308 007 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
High Temperature Glass Thermal Control Structure and Coating.
Patent Application,
D. A. Stewart, H. E. Goldstein, and D. B. Leiser. Filed 2 Oct 81, 18p N82-10228/6, NASA-CASE-ARC-11164-1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A high temperature stable and solar radiation stable thermal control coating either useful as such, applied directly to a member to be protected, or applied as a coating on a re usable surface insulation is discussed. The coating has a base coat layer and an overlay glass layer. The base coat layer has a high emittance, and the overlay layer is formed ffrom discrete, but sintered glass particles to give the overlay a high scattering coefficient. The resulting two-layer space and thermal control coating has an absorptivity-to-emissivity ratio of less than or equal to 0.4 at room temperature, with an emittance of 0.8 at 1200 F. It is capable of exposure to either solar radiation or temperatures as high as 2000 F without significant degradation. A reusable surface insulation structure in corporating the coating and having primary application as a space shuttle heat shield is also discussed.

PB82-858564 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Protective Coatings for Pipelines. 1966-1981 (Citations from the Metals Abstracts Data Base).
Rept. for Jan 66-Dec 81.
Dec 81, 151p
Supersedes PB81-858714.

The use of protective coatings and cathodic protection for the prevention of pipeline corrosion is discussed in the cited reports. The use of spray and wrapped coatings for underground and underwater installations is also discussed. Matherials used include epoxy resins, concrete, and metal overlays. (This updated bibliography contains 251 citations, 15 of which are new entries to the previous edition.)

PB82-859935 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Zinc and Zinc Alloys as Protective Coatings. 1966-1981 (Citations from the Metals Abstracts Data Base).
Rept. for Jan 66-Dec 81.
Dec 81, 86p
Supersedes PB81-857807.

The corrosion protection of materials by means of zinc coatings is discussed in the cited reports, exclusive of electroplating and electrodeposition. Zinc rich paints and metallization are featured, as well as polymeric coatings and paints based on zinc. Major applications include structural steel work, oil and gas pipes, pipe joints, and off shore structures. (This updated bibliography contains 127 citations, 13 of which are new entries to the previous edition.)

11D. Composite Materials

AD-A107 391/5 PC **A07**/MF **A01**
Materials Sciences Corp., Blue Bell, PA.
Study of Graphite/Epoxy Composites for Material Flaw Criticality.
Final rept. 18 May 79-31 Oct 80,
S. N. Chatterjee, and R. B. Pipes. 31 Oct 80, 146p
MSC/TFR/1106/1103, NADC-78241-60
Contract N62269-79-C-0209

Usefulness of NDE methodology for assessing criticality of disbonds with two-dimensional planforms located in laminated Graphite/Epoxy composites has been examined. A linear elastic fracture mechanics approach, semi-empirical growth laws, and methods of stress analysis based on a modified laminated plate theory have been studied for assessing growth rates of disbonds in a transverse shear environment. Elastic stability analysis has been utilized for laminates with disbonds subjected to in-plane compression and/or shear. Results of nondestructive inspections and destructive tests have been correlated with analytical predictions. In addition, effects of moisture conditioning and cyclic loading on wave velocities and attenuation of sound in Graphite/Epoxy composites and in neat resin samples have been studied. (Author)

AD-A107 538/1 PC **A03**/MF **A01**
Queen Mary Coll., London (England).
Environmental Failure of Adhesive Bonding in Composites.
Final rept.,
E. H. Andrews, Ho Ping Sheng, H. A. Majid, and C. Viachos. May 81, 48p
Grant DA-ERO-78-G-118

A recently developed fracture mechanics test (the A-S test), which involves pressurisation of an enclosed circular flaw, has been used to investigate the adhesion of two epoxy resins (Shell Epikote 828 and 3 M's SP 250) to glass. Specimens were tested after various times of immersion in water at 80 C and the adhesive failure energy theta determined. The effects of adding silane coupling agents to the epoxy resin and the influence of water pH were particularly studied. The theory of generalized fracture mechanics is used to derive, from theta, an intrinsic failure failure energy theta sub 0 which is the energy to break unit area of interatomic bonds across the interface. The decrease of theta sub 0 with time follows first order reaction kinetics, with a rate constant controlled by the type and concentration of coupling agent as well as by the pH of the aqueous environment. The results are interpreted in terms of the chemical hydrolysis of interfacial bonds. (Author)

LA-UR-80-1252 PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Thermodynamics of the Tantalum-Carbon-Chlorine-Hydrogen System Applied to the CVD of Carbide/Carbon Composite Materials.
R. G. Behrens, L. R. Newkirk, and T. C. Wallace. Apr 80, 33p CONF-800460-3
Contract W-7405-ENG-36
82. annual American Ceramic Society meeting, Chicago, IL, USA, 27 Apr 1980.

Complex equilibrium thermodynamic calculations using the computer code SOLGASMIX-PV were performed for the Ta-Cl-H and Ta-C-Cl-H systems in order to evaluate the chemistry associated with the chemical vapor deposition of Ta, Ta sub 2 C, and TaC on graphite yarn and woven structures. Results of the thermodynamic calculations were compared with coated materials prepared by hydrogen reduction of TaCl sub 5 (g) and C sub 3 H sub 6 (g) between 1025 and 1223 exp 0 K using a variety of reaction gas compositions. (ERA citation 05:024395)

N82-11116/2 PC **A06**/MF **A01**
TRW Defense and Space Systems Group, Redondo Beach, CA. Mechanical Engineering Lab.
Radiation Testing of Composite Materials, in Situ Versus Ex Situ Effects.
Final Report.
R. M. Kurland, J. F. Thomasson, and W. C. Beggs. Nov 81, 109p NASA-CR-3475, REPT-351710-6028-UT-01
Contract NAS1-15848

The effect of post irradiation test environments on tensile properties of representative advanced composite materials (T300/5208, T300/934, C6000/P1700) was investigated. Four ply (+ or - 45 deg/+ or - 45 deg) laminate tensile specimens were exposed in vacuum up to a bulk dose of 1 x 10 to the 10th power rads using a mono-energetic fluence of 700 keV electrons from a Van de Graaff accelerator. Post irradiation testing was performed while specimens were being irradiated (in situ data), in vacuum after cessation of irradiation (in vacuo data), and after exposure to air (ex situ data). Room temperature and elevated temperature effects were evaluated. The radiation induced changes to the tensile properties were small. Since the absolute changes in tensile properties were small, the existance of a post irradiation test environment effect was indeterminate.

N82-11117/0 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Novel Improved PMR Polyimides.
R. H. Pater. 1981, 18p NASA-TM-82733, E-1045
Presented at the 13TH Natl. Sampe Tech. Conf., Mt. Pocono, PA., 13-15 Oct. 1981.

A series of N-phenylnadimide (PN) modified PMR polyimide composites reinforced with graphite fibers was investigated. The improved flow matrix resins consist of N-phenylnadimide (PN), monomenthyl ester of 5-norbornene-2, 3-dicarboxylic acid (NE), dimethyl ester of 3,3, 4,4-benzophenonetetracarboxylic acide (BTDE), and 4,4 methylenedianiline (MDA). Five modified PMR resin systems were formulated by the addition of 4 to 20 mole percent N-phenylnadimide to the standard PMR-15 composition. These formulations and the control PMR resin were evaluated for rheological characteristics. The initial thermal and mechanical properties of the PN modified PMR and the control PMR/Celion 6000 composites were determined. The results show that the addition of N-phenylnadimide to PMR-15 significantly improved the resin flow characteristics without sacrificing the composites properties.

Concentrations of 4 and 9 mole percent PN appear to improve the thermoxidative stability of PMR composites.

N82-11119/6 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
The Industrial Processing of Unidirectional Fiber Prepregs.
B. Laird. Jun 81, 18p NASA-TM-76599
Contract NASW-3199
Transl. Into English from Plastiques Renforces, Fibres de Verre Textile V. 19, Jul.-Aug. 1980 p 9-16. Original Language Document Announced as A80-44924. Transl. By Kanner (Leo) Associates, Redwood City, Calif. Original DOC. Prep. By Ciba-Geigy France, S. A.

Progress made in the industrial processing of preimpregnated composites with unidirectional fibers is discussed, with particular emphasis on applications within the aerospace industry. Selection of industrial materials is considered. Attention is given to the conditions justifying the use of composites and the properties required of industrial prepregs. The hardening cycle is examined for the cases of nonmodified and polymer modified resins, with attention given to the stabilization of flow, the necessary changes of state, viscosity control, and the elimination of porosity. The tooling necessary for the fabrication of a laminated plate is illustrated, and the influence of fabrication and prepreg properties on the mechanical characteristics of a laminate are indicated. Finally, the types of prepregs available and the processing procedures necessary for them are summarized.

N82-11121/2 PC **A06**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Electrical Engineering.
Optical Fiber Interferometer for the Study of Ultrasonic Waves in Composite Materials.
Final Report, 1 Oct. 1980 - 30 Sep. 1981.
R. O. Claus, P. S. Zewekh, T. M. Turner, J. C. Wade, and R. T. Rogers. Oct 81, 98p NASA-CR-164916
Contract NAG1-68

No abstract available.

PB82-133992 Not available NTIS
National Bureau of Standards, Washington, DC.
Cryogenic Properties of Filamentary-Reinforced Composites: An Update.
Final rept.,
M. B. Kasen. Jun 81, 18p
Pub. in Cryogenics 21, p323-340 Jun 81.

Progress since 1975 in understanding the effect of cryogenic temperatures on the mechanical, elastic, thermal and electrical properties of fiber-reinforced structural composites is reviewed. The two categories considered are relatively inexpensive laminates reinforced with woven fabric or random mat and the more expensive uniaxial laminates often reinforced with high-performance, advanced fibers. The status of fundamental research and of test method development is reviewed and directions of effective future research are considered.

PB82-134016 Not available NTIS
National Bureau of Standards, Washington, DC.
Anisotropic Elastic Constants of a Fiber-Reinforced Boron-Aluminum Composite.
Final rept.,
S. K. Datta, and H. M. Ledbetter. 1980, 6p
Pub. in Proceedings of Mechanics of Nondestructive Testing, Blacksburg, Virginia, September 10-12, 1980, p215-230.

Elastic constants, both the C(ij)'s and the S(ij)'s, were measured and calculated for a laminated, uniaxially fiber-reinforced boron-aluminum composite. Three theoretical models were considered: square-array, hexagonal-array, and random-distribution. By combining several existing theoretical studies on randomly distributed fibers, a full set of elastic constants can be predicted for this model. The random-distribution model agrees best with observation, especially for off-diagonal elastic constants. Considering all nine elastic constants, observation and theory differ on the average by six percent.

11F. Metallurgy and Metallography

AD-A106 886/5 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Improvements in Department of the Interior Leasing of Potential Aluminum Resources Are Necessary for More Timely Decisionmaking.
10 Sep 81, 9p Rept no. GAO/EMD-81-135
See also Rept. no. GAO/EMD-81-44.

Excessive and unnecessary delays in processing alunite prospecting permit and preference right lease applications in several western states have frustrated development of a potential domestic aluminum resource. Exploration and development of such leasable nonfuel minerals as alunite cannot occur without Government approval. Thus, to allow inaction without formulating alternative means of allowing exploration and development automatically means there will be little or no activity. As the Department noted in responding to the results of our review, the Bureau of Land Management must coordinate adjudication and processing of mineral leasing activities with such surface management agencies as the Forest Service. The Department recognizes that, in such cases, the Bureau has less control in scheduling field examinations and environmental analysis. Further, the Department stated that, in some cases, permitees themselves do not aggressively pursue or react diligently to leasing requirements for economic, budgetary, or other internal reasons. The point is well taken--not all delay is attributable to Government slowness or indecision alone. This point should not, however, lead to a generalized assumption that unresponsiveness from any of the parties involved should be allowed to continue unchecked. We believe that neither lack of Government responsiveness nor insufficient permitee diligence should tie up disposition of valuable resources indefinitely, as appears to have been the case with alunite.

AD-A106 901/2 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Follow-up Report on Domestic Aluminum Resources: Dilemmas of Development.
29 Jun 81, 3p Rept no. GAO/EMD-81-96

This report is about supply disruptions and price gouging that could endanger aluminum production in this country have spurred Bureau of Mines research on processes to manufacture alumina from nonbauxitic ores. The United States has no large bauxite deposits but it has plentiful deposits of other aluminum ores if the technology can be developed to use them economically. Last July, however, GAO reported to the Congress that Bureau of Mines research in this area was 'fundamentally misdirected' (see EMD-80-63, July 17, 1980). (Author)

AD-A106 946/7 PC **A02**/MF **A01**
Northwestern Univ., Evanston, IL. Dept. of Materials Science.
Thresholds for Fatigue Initiation and Propagation and Plastic Work in HY80 and HY130 Steels.
Annual technical rept. 1 Sep 80-31 Aug 81,
Morris E. Fine. 30 Oct 81, 14p
Contract N00014-78-C-0565

The effect of tempering temperature on the fatigue crack propagation rate (FCPR) in the low stress intensity range of HY130 austenitized at 815 C was determined. Four treatments giving the same hardness, R.C. 34, were selected: A - 10 hrs at 400 C, B - 5 hrs at 550 C, C - 1 hr at 610 C and D - 1/4 hr at 650 C. Treatment C, the standard treatment for HY130, gave the highest value of stress intensity threshold, Delta Kth, and the lowest propagation rate at Delta K of 5 MPa square root of m. For HY80 intercritical heat treatments were developed to give desired distributions of ferrite and martensite for measurement of Delta Kth.

AD-A106 989/7 Not available NTIS
Virginia Univ., Charlottesville. Dept. of Materials Science.
Model for the Elongation of Boron on Tungsten during Chemical Vapor Deposition.
Final rept.,
J. W. Eason, R. A. Johnson, and F. E. Wawner.
1980, 17p Rept no. UVA/525322/MS81/108
Availability: Pub. in Ceramic Engineering and Science Proceedings, v1 n7-8B Jul-Aug 80 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 040/8 PC **A03**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Annapolis, MD. Ship Materials Engineering Dept.
Dynamic J sub i-R Curve Testing of HY-130 Steel.
Research and development rept.,
J. A. Joyce, and E. J. Czyryca. Oct 81, 35p Rept no. DTNSRDC/SME-81/57

The J-integral crack growth resistance properties of HY-130 steel were developed under dynamic loading conditions. The objective of this program was to extend the key curve method to evaluate ductile fracture properties of HY-130 steel compact specimens where the loading rate produced a load-line crack-opening displacement rate on the order of 9-inches per second. A key curve for HY-130 plate was developed under dynamic loading conditions using subsized specimens and was applied to tests of 1TCT Specimens. Results of ambient temperature tests showed that both J sub Ic and the tearing modulus of this steel were substantially elevated under dynamic loading. The fracture process of specimens tested under dynamic and static loading conditions was found to be similar and completely ductile. (Author)

AD-A107 116/6 PC **A02**/MF **A01**
Michigan Technological Univ., Houghton. Dept. of Metallurgical Engineering.
A Fracture Limit Diagram for Determining Hydrogen Embrittlement of Sheet under Multiaxial Loading Conditions.
Technical rept.,
R. J. Bourcier, and D. A. Koss. Sep 81, 14p Rept no. TR-16
Contract N00014-76-C-0037

The application of punch-stretch testing as a means of determining hydrogen embrittlement of sheet under multiaxial loading conditions is described. The results may be expressed in the form of a fracture limit diagram which identifies at fracture the principal strain components in the plane of the sheet for any multiaxial deformation path associated with a thinning of the sheet. As an illustration, a fracture limit diagram is reported for internally charged, commercially pure titanium sheet. The diagram clearly shows that the titanium is susceptible to hydrogen embrittlement under plane strain and biaxial loading paths even though no loss of ductility occurs in simple tension. (Author)

AD-A107 137/2 PC **A03**/MF **A01**
Michigan Technological Univ., Houghton. Dept. of Metallurgical Engineering.
Localized Necking: An Inclined Imperfection Model.
Technical rept.,
K. S. Chan, A. K. Ghosh, and D. A. Koss. Jul 81, 29p Rept no. TR-15
Contract N00014-76-C-0037
Prepared in cooperation with Stanford Univ., CA. Dept. of Materials Science and Engineering. and Rockwell International, Thousand Oaks, CA. Science Center.

The Marciniak and Kuczynski (M-K) analysis, which associates localized necking in sheet metal with pre-existing imperfections, has been modified such that the imperfection or groove is inclined (rather than normal) to the major principal strain axes. The analysis, which is closely related to the calculations of Hutchinson and Neale, takes into account the requirement for localized necking that a direction of zero-extension is inclined for strain states between uniaxial tension and plane strain. Based on the inclined imperfection model, calculations are presented for the negative minor strain regime of a forming limit diagram showing the dependence of localized necking on work hardening, strain rate sensitivity, plastic anisotropy, and imperfection factor. Theoretical calculations of forming limit curves indicate good agreement between the model and previously obtained experimental data for several alloys. Such agreement is obtained for realistically small imperfections, although the limit strains predicted by the model itself are relatively insensitive to the magnitude of the imperfection. (Author)

AD-A107 247/9 PC **E19**/MF **E19**
Battelle Columbus Labs., OH. Metals and Ceramics Information Center.
Corrosion Fatigue of Metals in Marine Environments.
State-of-the-Art,
C. E. Jaske, J. H. Payer, and V. S. Balint. Jul 81, 263p Rept no. MCIC-81-42

This book was prepared to document and review the major factors involved in corrosion fatigue of metals in marine environments. This includes both crack initiation and crack growth. Background information was obtained by searching technical literature through eight different sources--(1) Chemical Abstracts, (2) Metals Abstracts, (3) Metals and ceramics Information Center (MCIC), (4) Engineering Index, (5) Copper Data Center, (6) National Technical Information Service, (7) Defense Technical Information Service, and (8) Proceedings of Offshore Technology Conferences. Unpublished and proprietary papers and reports were excluded unless permission was obtained to release the results contained therein. Thus, most of the information was from documents published in the open literature. For convenient use and reference, discussions on corrosion-fatigue behavior are divided into separate chapters dealing with (1) carbon and alloy steels, (2) stainless steels, (3) nickel-base alloys, (4) copper-base alloys, (5) aluminum alloys, and (6) titanium alloys. Representative plots and tabulations of important data and factors influencing them are presented, but exhaustive plots and tabulations of all available data, such as might be found in handbooks, are not included because these are beyond the scope of this review. A general background for corrosion fatigue is presented in Chapter 2, which briefly discusses experimental procedures, general phenomena and mechanisms, variables affecting corrosion of metals in marine environments, and use of fatigue data in design.

AD-A107 255/2 PC **A12**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Mechanisms of Recovering Low Cycle Fatigue Damage in Incoloy 901.
Doctoral thesis,
Robert E. Schafrik. 1979, 261p Rept no. AFIT-CI-79-212D

The effect of thermal treatment and hot isostatic pressing (HIP) on eliminating low cycle fatigue (LCF) damage in the iron-nickel superalloy, Incoloy 901, was investigated. Testing was done in air at 500 deg F at a total strain range of 0.75%. The mechanisms of crack initiation and crack propagation in baseline specimens were determined and used as the basis of comparison for the rejuvenated specimens. Crack initiation in the baseline specimens was due to decohering of blocky grain boundary carbides. Pre-crack initiation damage consisted of extrusions and intrusions formed at persistent slip bands and partially decohered grain boundary carbides. A pre-rejuvenation damage level of 800 cycles (60% of crack initiation) was selected. Some specimens to be HIP processed were ceramic coated; the rest were left uncoated. Post-HIP testing revealed that LCF properties were adversely affected by surface microstructural damage caused by the HIP processing. Thermal rejuvenation, consisting of a standard solution treatment and double aging, was partially successful in recovering fatigue properties with a pre-rejuvenation damage level of 800 cycles. Initiation life was extended by 400 cycles and cycles to failure was extended by 600 cycles. This behavior is explained in terms of microstructural damage which is resistant to thermal treatment. (Author)

AD-A107 516/7 PC **A03**/MF **A01**
Newcastle upon Tyne Univ. (England).
The Oxidation and Corrosion Resistance of Nitrided Iron Alloys.
Annual rept. no. 1 (Final) Apr 79-Mar 80,
K. H. Jack. 27 Jul 81, 30p
Grant DA-ERO-79-G-0035

Potentiokinetic measurements show that the corrosion resistance of austenitic Fe-34w/o Ni alloys containing Mo or Ti is increased by nitriding in NH3:H2 gas mixtures to form respectively a homogeneous distribution of 3Mo2N precipitates or a modulated structure of Ti-N clusters. Resistance to aqueous corrosion is also increased in alloys containing nitrogen in solid solution. A commercial nitrogen alloyed steel, Nitronic 50, which has excellent corrosion resistance in the annealed condition is heavily attacked when tested after removal of nitrogen. High temperature oxidation studies of ferritic iron alloys in static air have been completed. No significant differences in weight gain is detected between alloys tested in the annealed, the nitrided or the nitrided and aged conditions for Fe-5w/o Mo and Fe-2.32w/o Cr alloys but superior oxide adhesion is observed on nitrided pure iron and alloys containing a dispersion of incoherent nitrides. Experiments on nitrided mild steel oxidised at 600 C demonstrate the resistance to fracture of oxides formed on nitrided alloys. (Author)

DE81032005 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Tensile Properties and Microstructure of Helium-Injected and Reactor-Irradiated V-20 Ti.
M. P. Tanaka, E. E. Bloom, and J. A. Horak. 1981, 16p CONF-8009179-4
Contract W-7405-ENG-26
ADIP program review meeting, Germantown, MD, USA, 30 Sep 1980.

The ojective of this work was to determine the effect of preinjected helium followed by neutron irradiation on the mechanical properties and microstructure of V-20% Ti. (ERA citation 06:035728)

DE81904216 PC **A04**/MF **A01**
Battelle Columbus Labs., OH.
Influence of Cyclic Load and Environmental Effects on Stress Corrosion Cracking of Sensitized Stainless Steel. Final Report.
E. L. White, and W. E. Berry. Aug 81, 62p EPRI-NP-1991

An experimental stress-corrosion cracking (SCC) study has been conducted in order to mitigate SCC in stainless steel piping in BWR's. Effect of the temperature, dissolved oxygen, and cyclic loading was studied on furnace sensitized Type 304 stainless steel. Slow strain rate tests at 4 x 10 exp -6 s exp -1 strain rate produced intergranular stress-corrosion cracking (IGSCC) at temperatures above 204 exp 0 C, suggesting a threshold temperature for IGSCC of about 130 exp 0 C at the 0.2 ppM oxygen level. Saturated solutions of AgCl produced IGSCC in slow strain rate tests in both aerated (8 ppM O sub 2) and deaerated (< 0.06 ppM O sub 2) tests at temperatures as low as 85 exp 0 C. Results suggest a potential hazard in using Ag/AgCl reference electrodes. IGSCC also was produced by trapezoidal cyclic loading (5 min load/unload, 10 or 75 min at load). Tests in 8 ppM oxygen water with the 75 min hold cycle, minimum load of 0.1 yield strength (YS) and maximum load greater than YS, indicated a threshold temperature for IGSCC of 190 exp 0 C. Other cyclic load tests in 288 exp 0 C - 8 ppM oxygen water with minimum load of 0.1 YS and maximum load less than YS, produced IGSCC at maximum loads as low as 0.7 YS in the rather high yield strength material studied (YS = 36.3 ksi at 288 exp 0 C). Low increment load cyclic loading produced IGSCC with cyclic loads ranging between 0.5 and 0.6 YS and 0.8 to 0.9 YS, but not at 0.6 to 0.7 YS or 0.7 to 0.8 Ys. The short hold cycle (10 min at load) was much less aggressive in promoting IGSCC than the long hold cycle (75 min at load). (ERA citation 06:035187)

DE82000158 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Swelling and Microstructure of HFIR Irradiated Austenitic Stainless Steels.
P. J. Maziasz. 1980, 16p CONF-8009179-3
Contract W-7405-ENG-26
ADIP program review meeting, Germantown, MD, USA, 30 Sep 1980.

The swelling and microstructural information available from HFIR-CTRs-9-13 are summarized and compared for CW 316 and CW(316 + Ti). These experiments were irradiated to moderate fluences of about 8 to 16 dpa and 500 to 1000 at. ppM He at irradiation temperatures ranging from 285 to 670 exp 0 C. These results are compared to higher fluence HFIR irradiation of CW 316 from HFIR-CTRs-2-8 irradiated at 375 to 680 exp 0 C at fluences up to 61 dpa and 4200 at. ppM He. Both the high- and low-fluence cavity volume fraction swelling curves for CW 316 have a similar shape. The curves show a definite swelling minimum at 470 to 570 exp 0 C that corresponds to the temperature of maximum precipitation. The swelling increases rather sharply with temperature at the higher and lower temperatures. The moderate fluence swelling levels are all below 0.5% delta V/V sub 0 . (ERA citation 06:035727)

HEDL-TME-79-6 PC **A05**/MF **A01**
Hanford Engineering Development Lab., Richland, WA.
Thermophysical Properties of Selected Wear-Resistant Alloys.
D. G. Farwick, and R. N. Johnson. Jun 80, 97p
Contract AC14-76FF02170

Thermophysical properties of 13 selected wear-resistant materials, including specific heat, thermal conductivity, thermal diffusivity, and thermal expansion (instantaneous, mean, and linear) are provided. The Center for Information and Numerical Data Analysis and Synthesis (CINDAS) at Purdue University supplied properties data. (ERA citation 05:032559)

LA-8351-MS PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Post Irradiation Dose Determination of 800 MeV Proton Irradiated Aluminum from LAMPF Experiment 407.
W. F. Sommer. May 80, 14p
Contract W-7405-ENG-36

Recorded here are the results of post irradiation radiochemistry analysis of 800 MeV proton irradiated ultra high purity aluminum. Standard gamma-ray counting equipment, including a Ge Li detector, a multichannel analyzer, and associated electronics, was employed to count the exp 22 Na activity in the activated aluminum. Since activation is proportional to proton fluence, relative dose levels can be determined. Also, use of a selected production cross section for exp 22 Na in aluminum and a calculated damage energy cross section, both for 800 MeV proton bombardment, allows determination of a calculated value for the number of displacements per atom (dpa) that the material received during an irradiation experiment at the Clinton P. Anderson Meson Physics Facility (LAMPF). It is felt that simple and sufficiently accurate post irradiation dose determination can be made when either the subject material is ultra high purity aluminum or if this material is provided as a monitor with other subject materials, the simplicity being that the transmutation product, isotope exp 22 Na, is relatively abundant and has a long half-life. (ERA citation 05:024422)

LBL-10259 PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Weldability of Thermally Grain-Refined Fe-12Ni-0.25Ti for Cryogenic Structural Applications.
D. E. Williams. Feb 80, 43p
Contract W-7405-ENG-48

The weldability of a research alloy designed for structural use in liquid helium temperature, cryogenic environments was investigated. Plates of iron-12 weight percent nickel-0.25 weight percent titanium were grain refined by the four-step, grain refining thermal treatment developed for this alloy and welded with Inconel Number 92 weld wire using the Gas Metal Arc (GMA) welding process with argon-15% helium gas shielding. Both a single pass and a double-sided, 2 pass electron beam (EB) weld were also made without filler metal addition. Weldments were radiographed and sectioned and the charpy V-notch specimens removed were tested at liquid nitrogen and helium temperatures. (ERA citation 05:024369)

LBL-11109 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Erosion-Corrosion-Wear Program.
A. V. Levy. Jul 80, 25p
Contract W-7405-ENG-48
Excerpt from LBL-10000.

Progress is reported concerning erosion mechanics in ductile metals, erosion of thin scales, erosion mechanics in brittle solids, effect of particle characteristics on erosion of ductile material, and the halo effect in jet impingement solid particle erosion testing of ductile metals. Corrosion behavior studies by char and catalytic deactivation are reported. Gas-particle flow in the entry region of curved pipes, separation effects in gas-particle flows at high Reynolds number, and aerodynamic effects in the erosion process are discussed. (ERA citation 05:032560)

N82-11181/6 PC **A04**/MF **A01**
Kaiser Aluminum and Chemical Corp., Pleasanton, CA. Center for Technology.
Flaw Growth of 7075, 7475, 7050 and 7049 Aluminum Alloy Plate in Stress Corrosion Environments: 4-Year Marine Atmosphere Results.
Interim Report.
K. R. Hasse, and R. C. Dorward. 13 Oct 81, 63p
NASA-CR-161887, CFT-RR-81-15
Contract NAS8-30890

After nearly 53 months of exposure to marine atmosphere, crack growth in SL DCB specimens from 7075, 7475, 7050, and 7049-T7X plate has slowed to the arbitrary 10 to the -10 power m/sec used to define threshold stress intensity. Because some specimens appear to be approaching crack arrest, the importance of self-loading from corrosion product wedging as a

significant driving force for crack propagation in over-aged materials is questioned. Crack length-time data were analyzed using a computer curve fitting program which minimized the effects of normal data scatter, and provided a clearer picture of material performance. Precracked specimen data are supported by the results of smooth specimen tests. Transgranular stress corrosion cracking was observed in TL DCB specimens from all four alloys. This process is extremely slow and is characterized by a striated surface morphology.

N82-11182/4 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Trends in High Temperature Gas Turbine Materials.
S. J. Grisaffe, and R. L. Dreshfield. 1981, 18p NASA-TM-82715, E-999
Presented at the 1981 Aerospace Conf., Anaheim, Calif., 5-8 Oct.

High performance - high technology materials are among the technologies that are required to allow the fruition of such improvements. Materials trends in hot section components are reviewed, and materials for future use are identified. For combustors, airfoils, and disks, a common trend of using multiple material construction to permit advances in technology is identified.

N82-11184/0 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Failure Analysis of a Tool Steel Torque Shaft.
J. R. Reagan. 1981, 12p NASA-TM-82758, E-1077
Presented at the Conf. On Deformation, Fracture, Wear and Nondestructive Evaluation of Mater., New Orleans, 23-24 Nov. 1981; Sponsored by AM. Phys. Soc. And Nat. Bureau of Standards.

A low design load drive shaft used to deliver power from an experimental exhaust heat recovery system to the crankshaft of an experimental diesel truck engine failed during highway testing. An independent testing laboratory analyzed the failure by routine metallography and attributed the failure to fatigue induced by a banded microstructure. Visual examination by NASA of the failed shaft plus the knowledge of the torsional load that it carried pointed to a 100 percent ductile failure with no evidence of fatigue. Scanning electron microscopy confirmed this. Torsional test specimens were produced from pieces of the failed shaft and torsional overload testing produced identical failures to that which had occurred in the truck engine. This pointed to a failure caused by a high overload and although the microstructure was defective it was not the cause of the failure.

ORNL/TM-7232 PC **A07**/MF **A01**
Oak Ridge National Lab., TN.
Fossil Energy Materials Needs Assessment.
R. T. King, and R. R. Judkins. Jul 80, 144p
Contract W-7405-ENG-26

An assessment of needs for materials of construction for fossil energy systems was prepared by ORNL staff members who conducted a literature search and interviewed various individuals and organizations that are active in the area of fossil energy technology. Critical materials problems associated with fossil energy systems are identified. Background information relative to the various technologies is given and materials research needed to enhance the viability and improve the economics of fossil energy processes is discussed. The assessment is presented on the basis of materials-related disciplines that impact fossil energy material development. These disciplines include the design-materials interface, materials fabrication technology, corrosion and materials compatibility, wear phenomena, ceramic materials, and nondestructive testing. The needs of these various disciplines are correlated with the emerging fossil energy technologies that require materials consideration. Greater emphasis is given to coal technology - particularly liquefaction, gasification, and fluidized bed combustion - than to oil and gas technologies because of the perceived inevitability of US dependence on coal conversion and utilization systems as a major part of our total energy production. (ERA citation 05:031476)

ORNL-5616 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Metallurgical and Mechanical Properties of Thorium-Doped Ir-0.3% W Alloys.
C. T. Liu, H. Inouye, and A. C. Schaffhauser. Apr 80, 22p
Contract W-7405-ENG-26

Metallurgical and mechanical properties of Ir-0.3% W alloys have been studied as a function of thorium concentration in the range 0 to 1000 ppM by weight. The solubility limit of thorium in Ir-0.3% W is below 30 ppM. Above this limit, the excess thorium reacts with iridium to form second-phase particles. Thorium additions raise the recrystallization temperature and effectively retard grain growth at high temperatures. Tensile tests at 650 exp 0 C show that the alloy without thorium additions (undoped alloy) fractured by grainboundary (GB) separation, while the alloys doped with less than 500 ppM thorium failed mainly by transgranular fracture at 650 exp 0 C. Intergranular fracture in the doped alloys is suppressed by GB segregation of thorium, which improves the mechanical properties of the boundary. The impact properties of the alloys were correlated with test temperature, grain size, and heat treatment. The impact ductility increases with test temperature and decreases with grain size. For a given grain size, particularly in the fine-grain size range, the thorium-doped alloys are much more ductile and resistant to GB fracture. All of these results can be correlated on the basis of stress concentration on GBs by using a dislocation pileup model. (ERA citation 05:020884)

PB82-137266 PC **A99**/MF **A01**
National Bureau of Standards, Washington, DC.
Proceedings, U.S. Department of Commerce Public Workshop on Critical Materials Needs in the Aerospace Industry, February 9-10, 1981,
John B. Wachtman Jr. Jul 81, 700p NBSIR-81-2305

On February 9 and 10, 1981, the Department of Commerce held a Public Workshop to obtain the views of the American Public on three questions directly pertinent to the Department's responsibilities under the Materials and Minerals Policy, Research and Development Act of 1980, Public Law 96-479. These questions were: What are the materials issues of primary concern to he American aerospace industry and its suppliers; What recommendations do the American aerospace industry and its suppliers have for Federal action to address these issues; Which specific materials should the Department of Commerce review in detail over the next few months in order to recommend the most urgently needed programs for Federal action. The Workshop addressed these questions within three distinct areas: critical raw materials, critical engineering materials, and substitution, conservation, specialized recycling, and higher performance. This report includes the formal views presented to the plenary workshop sessions, the reports of the Workshop Task Forces in each of the three above areas, and the written submissions invited in the Federal Register notice of the Workshop.

PB82-137415 Not available NTIS
National Bureau of Standards, Washington, DC.
Microcreep of Instrument Grade Beryllium.
Final rept.,
R. S. Polvani, and B. W. Christ. Jul 79, 5p
Pub. in SAMPE Quarterly 10, n4 p37-41 Jul 79.

Inertial guidance system gyroscopes and optical mirrors are designed to be dimensionally stable to better than 1 microinch over long times. New gyroscope designs require still better stability, 0.01 microinch. Uniaxial microcreep experiments at elevated temperature show instrument grade beryllium deforms in excess of both design limitations. However, a microstrain hardening process was observed that seems a possibility for improving microcreep strength. Performing these experiment required development of a test system with better than 0.1 microinch resolution, less than 0.01 microinch thermal noise in the signal at 144F, and typically, sample misalignment of about .00001 radians.

PB82-858572 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Alloying Effects of Tungsten. 1966-1981 (Citations from the Metals Abstracts Data Base).
Rept. for Jan 66-Dec 81.
Dec 81, 182p
Supersedes PB81-857146.

The effects of tungsten as an alloying element are discussed in the cited reports in terms of improvement of the mechanical properties of the alloys. Major emphasis is placed on the addition of tungsten to steels and titanium base alloys. The improvement in tool wear, and creep rupture strength of the alloys are also discussed. (This updated bibliography contains 251 citations, 18 of which are new entries to the previous edition.)

PB82-858580 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
High Temperature Sulfidation of Cobalt and Cobalt Alloys. 1970-1981 (Citations from the NTIS Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 97p
Supersedes PB81-853202.

The high temperature corrosion of cobalt and cobalt alloys is discussed in the cited reports. Primary emphasis is placed on the sulfidation corrosion of turbine blades due to the formation of molten sulfates on blade surfaces. The effect of the sulfur content of fuels is also discussed. (This updated bibliography contains 68 citations, 15 of which are new entries to the previous edition.)

PB82-858846 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Flotation Separation of Nickel Particles. 1966-1981 (Citations from the Metals Abstracts Data Base).
Rept. for Jan 66-Dec 81.
Dec 81, 129p

This bibliography cites reports on the recovery of nickel particles by flotation separation. Froth flotation, foam separation, and foam flotation processes are examined. Electrochemical methods, flotation pyrite application to the briquetting of nickel ores, economical factors of nickel recovery, thermodynamics involved in the whetting behavior, and performance evaluations of flotation separation of nickel particles are included. (Contains 197 citations fully indexed and including a title list.)

PB82-858986 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Corrosion Protection of Metals and Metal Alloys. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 173p
Supersedes PB81-853756. Prepared in cooperation with the Department of Energy, Washington, DC.

The corrosion protection of metals and metal alloys is discussed in the cited reports in terms of electrochemical concepts, which include metal passivation and cathodic protection. The use of protective coatings and corrosion inhibitors is also discussed. Emphasis is placed on high temperature corrosion in coal gasification environments, as well as molten salt systems. (This updated bibliography contains 164 citations, 94 of which are new entries to the previous edition.)

PB82-859000 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Extractive Metallurgy. 1970-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 205p
Supersedes PB81-851339.

The citations cover worldwide information on extractive metallurgy and its various processes. The kinetics of extractive techniques are included. Representative processes considered include fluidized bed electrode, solvent and centrifugal extraction. The extraction of copper, rare earths, precious metals, and uranium from ores is discussed. (This updated bibliography contains 202 citations, 31 of which are new entries to the previous edition.)

PB82-859240 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
High Temperature Sulfidation of Iron and Iron Alloys. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 137p

Supersedes PB81-853194. Prepared in cooperation with the Department of Energy, Washington, DC.

The high temperature corrosion of iron and iron alloys is discussed in the cited reports. The effects of sulfur containing fuels on the sulfidation process are presented as they relate to corrosion in gas turbines, coal gasification, and fluidized bed processors. Changes in both physical and metallurgical properties due to sulfidation are also discussed. The use of additives to reduce the sulfidation process is also included. (This updated bibliography contains 120 citations, 36 of which are new entries to the previous edition.)

PB82-859364 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Flotation Separation of Copper Particles. 1966-1981 (Citations from the Metals Abstracts Data Base).
Rept. for Jan 66-Dec 81.
Dec 81, 125p

Reports are cited which discuss copper particle recovery from concentrates by flotation separation which uses the surface properties of the selected particles to cause them to float. Flotation agents and reagents are discussed with consideration given to the evaluation of the recovery performance of copper particles. Extraction of copper from poor copper-porphyry ores, khetri slag flotation tailings, copper-oxide minerals, and metal particle-containing sludges pumped from sea bottoms; innovative technologies in providing minimal copper losses; and considerations in copper flotation plant design, computer control systems, and plant operations are among the topics included in this bibliography. (Contains 179 citations fully indexed and including a title list.)

PB82-859398 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Flotation Separation of Cobalt and Titanium Particles. 1966-1981 (Citations from the Metals Abstracts Data Base).
Rept. for Jan 66-Dec 81.
Dec 81, 85p

Citations in this bibliography include flotation recovery processes for the extraction of cobalt and titanium from concentrates by causing the selected particles to float by utilizing different surface chemical properties. Ion flotation from solution of manganese ore, recovery from slags of autogenous smelting of copper-nickel concentrates, extraction from hard alloy waste, and flotation agents and reagents are among the topics considered relative to the recovery of cobalt and titanium. Evaluation of the degree of separation of particles by flotation is included with respect to determination by infrared spectroscopy. (Contains 131 citations fully indexed and including a title list.)

PB82-859406 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Flotation Separation of Gold and Silver Particles. 1966-1981 (Citations from the Metals Abstracts Data Base).
Rept. for Jan 66-Dec 81.
Dec 81, 86p

This bibliography contains citations concerned with the recovery of gold and silver from concentrations by flotation separation which causes selected particles to float by utilizing different surface chemical properties. Testing procedures and performance evaluations of the flotation process variations of such concentrates as cyanide solutions, sulfide ores from sand and gravel operations, and residue dumps are examined. Flotation reagent developments for gold and silver recovery are included with performance evaluations. (Contains 124 citations fully indexed and including a title list.)

PB82-859539 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Analysis Applied to Metallography. 1970-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 103p
Supersedes PB81-853772.

This bibliography covers computerized simulation, modeling, and analysis applied to the study of the formation, microstructure, composition, and phases of various metals and metal alloys. There is some theoretical consideration of metallographic methods or techniques also. (This updated bibliography contains 95 citations, 40 of which are new entries to the previous edition.)

PB82-859604 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Metals Recovery from Wastes. June, 1976-1981 (Citations from the Energy Data Base).
Rept. for Jun 76-Dec 81.
Dec 81, 96p
Supersedes PB80-856230. Prepared in cooperation with the Department of Energy, Washington, DC.

This retrosepctive bibliography cites reports relating to techniques and technology for the recovery and recycling or reuse of ferrous and nonferrous metals. The metals are from various kinds of industrial and municipal wastes. (This updated bibliography contains 92 citations, 16 of which are new entries to the previous edition.)

PB82-859687 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Fracture Toughness. 1970-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 251p
Supersedes PB81-857468.

Citations concerning fracture toughness values and tests of aluminum, cast iron, steels, other nonferrous alloys and adhesive bonded laminates are contained in this bibliography. Drop weight, charpy-v-notch, dynamic tear, J-integral, and ultrasonic testing procedures are discussed. (This updated bibliography contains 250 citations, 51 of which are new entries to the previous edition.)

11H. Oils, Lubricants, and Hydraulic Fluids

AD-A107 323/8 PC **A04**/MF **A01**
Joint Oil Analysis Program, Pensacola, FL. Technical Support Center.
Determination of Sample Container Effects on Wearmetals Concentration in MIL-L-7808 Synthetic Lubricant Analyzed on an A/E35U-3 Fluid Analysis Spectrometer.
Final rept.,
R. S. Lee, R. Muthart, and E. Fox. Mar 79, 55p Rept no. JOAP-TSC-TR-79-001

This report presents a comparison of three sample containers commonly used with an A/E35U-3 Fluid Analysis Spectrometer. Data from the analysis of wearmetals in MIL-L-7808 synthetic lubricants was analyzed by several standard statistical techniques. These techniques were chosen to detect differences in analytical data and isolate variance that could be attributed to the sample containers. Results of these tests show that the sample containers tested can be used interchangeably and have negligible effects on the analytical method. (Author)

11I. Plastics

AD-A106 913/7 Not available NTIS
Alabama Univ., University. Dept. of Chemistry.
Synthesis, Radiation Degradation, and Electron Beam Resist Behavior of Fluorine-Containing Vinyl Polymers,
C. U. Pittman, Jr., M. Ueda, C. Y. Chen, J. H. Kwiatkowski, and C. F. Cook, Jr. 21 Oct 80, 8p ARO-16201.6-C
Contract DAAG29-79-C-0128
Availability: Pub. in Jnl. of the Electrochemical Society, v128 n8 p1758-1762 Aug 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A106 942/6 PC **E15**/MF **E15**
Army Materiel Development and Readiness Command, Alexandria, VA.
Engineering Design Handbook. Discontinuous Fiberglass Reinforced Thermoplastics.
Apr 81, 383p Rept no. DARCOM-P-706-314

This handbook provides information related principally to families of thermoplastics reinforced with strand 'E' glass. The handbook content, while limited to molding materials, advises the reader that other forms of thermoplastic materials-such as foams and elastomers-are also glass reinforced. The wealth of detail and information presented will acquaint US Army Materiel Development and Readiness Command personnel with the range of available materials and their unique mechanical, electrical, and physical properties; fabrication processes, including joining, together with their advantages and disadvantages; and areas of glass-reinforced thermoplastics (GRTP) application. Thus potential uses of GRTP's-with their attendant lower cost and ease of production-are suggested for the design and procurement of Army material. The handbook features the relationships between the GRTP's and their properties-the relationships are displayed both in tabular form and graphically. The influence of composite variables-volume of glass fiber; glass strand solids and bundle size; glass filament diameter, length, and orientation-on properties are similarly displayed. Another unique feature of the handbook is the manner in which the polymers and their associated properties are presented. In one breakout, the GRTP's are displayed as the independent variable; in a second breakout, the properties are displayed as the independent variable.

AD-A106 965/7 PC **A02**/MF **A01**
Pennsylvania Univ., Philadelphia.
Photoconductivity in Polyacetylene.
Technical rept.,
S. Etemad, T. Mitani, M. Ozaki, T. C. Chung, and A. J. Heeger. 10 May 81, 9p Rept no. TR-81-7
Contract N00014-81-K-0648
Pub. in Solid State Communications, v40 n1 p75-79 1981.

No abstract available.

AD-A106 970/7 PC **A02**/MF **A01**
Royal Aircraft Establishment, Farnborough (England).
A Basic Computer Program to Calculate Moisture Content in Resins and Fibre Reinforced Resin Composites.
Technical memo.,
P. T. Curtis. Jun 81, 20p RAE-TM-MAT-375, DRIC-BR-79976

A basic language computer program is presented which calculates the moisture absorption of epoxy resin and fibre composite sheets from the sheet thickness, the diffusivity and the relative humidity of the environment. One-dimensional Fickian diffusion is assumed in the calculations. The program gives the water absorbed by the material in a given exposure time, together with the times for the material to absorb 95% and 99% of the maximum water uptake. In addition, the distribution of water through the laminate thickness is calculated and displayed graphically. The programme can be used for any resin or fibre composite in which the primary moisture diffusion mechanism is bulk diffusion through the resin. Examples for typical fibre reinforced epoxy composite laminates are given and the implications are discussed. Diffusion data for three materials at room temperature and two materials at 50 C are listed for use in the program. (Author)

AD-A107 069/7 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Chemical Engineering.
Estimation of the Homogenization Temperature of a 1.2 Polybutadiene/1.4 Polybutadiene Diblock Copolymer Using Rheological Testing Methods.
Technical rept.,
R. E. Cohen, and M. -Y. Lin. 25 Oct 81, 22p Rept no. TR-9
Contract N00014-77-C-0311

Four samples containing various proportions of 1.2 and 1.4 polybutadiene were subjected to a series of rheological tests in which the dynamic storage modulus was determined over a range of temperature (30 C-160 C) and frequently (0.1-100 rad/sec). Isochronal plots of G' vs temperature showed that one of the samples (diblock 30/50, containing 38% 1, 2 polybutadiene) was substantially different in its rheological be-

havior. Appropriate treatment of the data revealed a 'rubberlike' plateau at low frequencies which began to disappear around 70 C and was completely missing at 100 C and above. From these results it was tentatively concluded that this sample undergoes a transition from a heterogeneous to a homogeneous morphology between 70 C and 100 C. (Author)

AD-A107 122/4 PC **A02**/MF **A01**
Massachusetts Univ., Amherst. Dept. of Polymer Science and Engineering.
Creation and Annihilation of Solitons, Radicals, and Ions in Polyacetylene as Related to the Mechanisms of Isomerization, Doping, and Conduction.
Technical rept.,
James C. W. Chien. 2 Sep 80, 16p Rept no. TR-81-10
Contract N00014-81-K-0648
Pub. in Jnl. of Polymer Science: Polymer Letters Edition, v19 p249-260 1981.

No abstract available.

AD-A107 130/7 PC **A03**/MF **A01**
Naval Surface Weapons Center, Silver Spring, MD.
Battery Separators Based on Polyphenylquinoxaline Polymer Blends.
Final rept.,
Isaac Angres, Len Kowalchik, and Wendy Parkhurst. 1 Apr 81, 34p Rept no. NSWC/TR-81-17

This document is a final report on battery separators based on polyphenylquinoxaline (PPQ) polymer blends. The report describes the preparation of the polymer blends and their extrusion into membranes, reports a series of quality assurance tests for the membranes, and reports cycle life testing of the new membranes. The test results for the PPQ blend membranes are compared with the results obtained for standard separator membranes. It is concluded that PPQ/Cellulose Acetate is a good candidate material for alkaline battery separators; however, because of cost considerations, it is not competative with similar state-of-the-art materials. (Author)

AD-A107 153/9 Not available NTIS
State Univ. of New York at Stony Brook.
Photon Correlation Spectroscopy of Bulk Siloxane Polymers,
G. Fytas, Th. Dorfmueller, Y. -H. Lin, and B. Chu. 23 Jan 81, 5p ARO-16426.7-C
Contract DAAG29-79-C-0069, Grant NSF-DMR80-1652
Availability: Pub. in Macromolecules, v14 p1088-1091 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 158/8 Not available NTIS
Virginia Polytechnic Inst. and State Univ., Blacksburg.
The Wear of Polymers Sliding on Polymeric Films Deposited on Rough Surfaces,
N. S. Eiss, Jr., and K. A. Smyth. 26 Feb 80, 9p ARO-14658.5-E
Grant DAAG29-77-G-0102
Presented at the Century 2 ASME-ASLE International Lubrication Conference, 18-21 Aug 80, San Francisco, CA.
Availability: Pub. in Jnl. of Lubrication Technology, v103 p266-273 Apr 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 161/2 Not available NTIS
State Univ. of New York at Stony Brook. Dept. of Chemistry.
Depolarized Rayleigh Spectra of Siloxane Polymers,
Y.-H. Lin, G. Fytas, and B. Chu. 24 Mar 80, 8p ARO-16426.8-C
Contract DAAG29-79-C-0069
Availability: Pub. in Jnl. of Chemical Physics, v75 n5 p2091-2097, 1 Sep 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 165/3 PC **A02**/MF **A01**
IBM Research Lab., San Jose, CA.
The Chemistry of Polyacetylene Doping.
Technical rept.,
T. C. Clarke, B. W. McQuillan, J. F. Rabalt, J. C. Scott, and G. B. Street. 31 Aug 81, 20p Rept no. TR-5
Contract N00014-80-C-0779

Natural abundance 13C Nuclear Magnetic Resonance experiments using cross polarization and magic angle spinning provide a unique method for monitoring the doping of polyacetylene. In contrast with previous authors we find that the doping of cis-polyacetylene with AsF5 leads, even at low doping levels, to a new signal characteristic of the doped regions of the polymer. Similar measurements on trans-polyacetylene indicate that the doping of the trans isomer proceeds considerably more uniformly than that of the cis isomer. Comparisons with appropriate model compounds suggest that the observed shift of the 13C NMR signal on doping is primarily a chemical shift rather than a Knight shift. Finally we discuss recent results on the nature of proton acid doping of polyacetylene, a process which shows remarkable similarities to oxidative doping. (Author)

AD-A107 166/1 PC **A02**/MF **A01**
IBM Research Lab., San Jose, CA.
Preparation and Characterization of Neutral and Oxidized Polypyrrole Films.
Technical rept.,
G. B. Street, T. C. Clarke, M. T. Krounbi, K. K.Kanazawa, and V. Y. Lee. 31 Aug 81, 14p Rept no. TR-6
Contract N00014-80-C-0779

Oxidized and neutral films of polypyrrole have been prepared electrochemically in the absence of oxygen and water. The neutral films are insulating and can be readily oxidized by chemical oxidizing agents to give films of greater conductivity than can be achieved by electrochemical oxidation. Optical spectroscopy provides evidence for the similarity of the polymeric carbonium ion produced by both types of oxidation. NMR studies are consistent with the alpha, alpha' bonding in these polymers; they also show the expected downfield shifts relative to the neutral polymer on both chemical and electrochemical oxidation. Electron Spin Resonance studies of both the electrochemically oxidized and the neutral polymer suggest the presence of highly mobile spins. (Author)

AD-A107 237/0 PC **A03**/MF **A01**
Kingston Polytechnic, Kingston upon Thames (England).
The Fracture of Thermosetting Resins after Exposure to Water.
Annual rept. no. 2,
Geoffrey Pritchard, R. G. Rose, W. E. Douglas, J. Ghotra, and D. Ho. Sep 81, 32p
Contract DAJA37-79-C-0505

This report considers the importance of molecular weight and molecular weight distribution in determining (a) the hydrolytic stability and (b) the fracture toughness of thermosetting resins. Experimental work (still incomplete) is described. Several orthophthalic polyester resins have been prepared and characterised, and some of them fractionated by precipitation with solvent: non-solvent mixtures. The fracture parameters, hot water resistance and property retention characteristics of the original resins are being compared with those of the fractions, with a two year period of immersion in distilled water at 50 deg C. Medium and high molecular weight fractions show improved hot water resistance. Molecular weight distributions are being measured by gel permeation chromatography and adjusted by combinations of synthetic, blending and fractionating procedures. (Author)

AD-A107 274/3 PC **A02**/MF **A01**
Massachusetts Univ., Amherst.
Soliton Formation and cis trans Isomerization in Polyacetylene.
Technical rept.,
James C. W. Chien, Frank E. Karasz, and Gary E. Wnek. 7 Jan 80, 8p Rept no. TR-81-9
Contract N00014-81-K-0648
Pub. in Nature. v285 n5764 p390-392, 5 Jun 80.

No abstract available.

AD-A107 350/1 Not available NTIS
Northwestern Univ., Evanston, IL. Dept. of Civil Engineering.
Fields near a Rapidly Propagating Crack-Tip in an Elastic Perfectly-Plastic Material,
J. D. Achenbach, and V. Dunayevsky. 15 Oct 80, 21p
Availability: Pub. in Jnl. of the Mechanics and Physics of Solids, v29 n4 p283-303 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 389/9 PC **A02**/MF **A01**
Texas Univ. at Austin. Dept. of Chemical Engineering.
Miscible Polymer Blends Based on Polycarbonate and a Copolyester.
Final rept. 28 Sep 78-27 Sep 81,
D. R. Paul, and J. W. Barlow. 30 Sep 81, 12p ARO-15466.5-C
Grant DAAG29-78-G-0207

A thorough study was made of the thermodynamic, melt processing, mechanical property, environmental stability, and gaseous sorption and transport behaviour of a model miscible blend system comprised of Polycarbonate, PC, and a copolyester made from 1,4-cyclohexane dimethanol and a mixture of isophthalic and terephthalic acids. Generally the mechanical properties of this blend relative to those often observed for immiscible mixtures, are quite good and data have been developed which suggest that the interactions between polymer blend components responsible for miscibility are also responsible for deviations in blend moduli, strength, density, ductility, Henry's Law portion of gas sorption, and in gas permeation rates, relative to those expected for purely additive behavior. this miscible blend system was found to exhibit some interesting chemical phenomena. When annealed just below its melting point, Tm, the copolyester was found to undergo crystallization induced chemical rearrangements, CICR, which resulted in abnormally high levels of crystallinity and crystalline melting points.

N82-11208/7 PC **A04**/MF **A01**
Polytechnic Inst. of New York, Brooklyn.
The Stability of New Transparent Polymeric Materials: The Epoxy Trimethoxyboroxine System. Part 1: The Preparation, Characterization and Curing of Epoxy Resins and Their Copolymers.
Final Report.
E. Pearce, and S. C. Lin. 1981, 58p NASA-CR-164951
Grant NSG-2182

The effects of resin composition, curing conditions fillers, and flame retardant additives on the flammability of diglycidyl ether of bisphenol-A (DGEBA) as measured by the oxygen index is examined. The oxygen index of DGEBA cured with various curing agents was between 0.198 to 0.238. Fillers and flame retardant additives can increase the oxygen index dependent on the material and the amount used. Changes in the basic cured resin properties can be anticipated with the addition of noncompatible additives. High flame resistant epoxy resins with good stability and mechanical properties are investigated.

PAT-APPL-6-293 412 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Method of Neutralizing the Corrosive Surface of Amine-Cured Epoxy Resins.
Patent Application,
S. Y. Lee. Filed 14 Aug 81, 9p N82-10227/8, NASA-CASE-GSC-12686-1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

The corrosive alkaline surface layer of an epoxy resin product formed by the curing of the epoxy with an aliphatic amine is eliminated by first applying a non-solvent to remove most or all of the free unreacted amine and then applying a layer of a chemical reagent to neutralize the unused amine or amine functional groups by forming a substituted urea. The surface then may be rinsed with acetone and then with alcohol. The non-solvent may be an alcohol. The neutralizing chemical reagent is a monoisocyanate or a mono-isothiocyanate. Preferred is an aromatic mono-isocyanate such as phenyl isocyanate, nitrophenyl isocyanate or napthyl isocyanate.

PB82-802554 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Polycarboranes. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 156p
Supersedes PB80-814163, and NTIS/PS-79/0913.

The bibliography covers the synthesis, polymerization, and the physical and molecular properties of carbor-

ane polymers and copolymers. Dexsil polymers and heat resistant properties are also covered. (This updated bibliography contains 150 citations, 10 of which are new entries to the previous edition.)

11J. Rubbers

DE81030128 PC **A03**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Interferometric Study of Epoxy Resin Gelation.
K. R. Hirschbuehler. 1981, 28p CONF-8106158-1
Contract AC04-76DP00789
Office of Naval Research critical review: techniques for the characterization of composite materials, Cambridge, MA, USA, 8 Jun 1981.

The transition of epoxy resins from a mobile liquid to a rubbery gel is a complex process depending on chemical reaction kinetics and both heat and mass transfer. The purpose of this study is to determine the locus of initial gelation in an epoxy resin, and the course of gelatin through both neat resins and glass fiber/epoxy resin composites. This was accomplished by monitoring the local changes in refractive index in transparent epoxy castings using laser interferometry, supplemented by temperature profiles obtained from thermocouple arrays. These experiments were carried out on pure DGEBA epoxy (DOW DER-332) cured with a variety of primary amine, secondary amine, and anhydride curing agents. (ERA citation 06:035218)

11L. Wood and Paper Products

PAT-APPL-6-276 764 PC **A02**/MF **A01**
Department of Agriculture, Washington, DC.
Energy Efficient Lumber Dry Kiln Using Collectors and Refrigeration System.
Patent Application,
Peter Y. S. Chen, Wayne A. Helmer, and Howard N. Rosen. Filed 24 Jun 81, 21p PB82-135567
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

The patent application relates to a method and apparatus to control temperature and humidity in drying a material, for example green lumber, including a chamber to receive the lumber in stacked relation with air flow space between individual lumber pieces, a refrigeration system having a refrigerant compressor, evaporator and condenser, blower means to circulate air from the condenser over and through a stack of lumber, and conduit means to communicate with the chamber for emission of air passing over the stack of lumber.

PB82-859257 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Dust Control in Pulp/Paper Mills. 1972-1981 (Citations from the Institute of Paper Chemistry Data Base).
Rept. for Jan 72-Dec 81.
Dec 81, 200p

Reports are cited which discuss the treatment, collection, and control of dust generated during pulping and paper manufacturing processes. Sulfite pulping, apparatus for treating collected dust, dechlorination of dust, fabric filters used in paper and pulp dust collection, innovative methods for conveying fibrous materials, application of electrostatic and wet dust collection systems, and economic considerations in handling the dust problem are among the topics examined relative to dust control in the paper industry. Detection, measurement, and analysis processes of airborne paper and pulp particles are included with reference to OSHA and federal regulations on environmental protection (Contains 161 citations fully indexed and including a title list.)

PB82-859273 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Dust Control in Pulp/Paper Mills. 1976-1981 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 123p

This bibliography contains citations concerned with machine design developments for dust control and extraction relative to such paper/pulp mill processes as radiation pulp/paper dryers, handling empty packaging sacks, packaging powdered products, sulfite pulping processes, and pigment conveying systems. The removal of electrostatic charges which generate dust circulation, measurement of the dust concentrations of paper, and procedures for eliminating dust from glassware in the bottling industry are among the topics examined. Dust generated health hazards to employees are included relative to such factors as dust effects on the human body, protective clothing, regulations, plant design, and good housekeeping operations. (Contains 75 citations fully indexed and including a title list.)

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-A106 931/9 PC **A02**/MF **A01**
Maryland Univ., College Park. Coll. of Business and Management.
Developments in Discrete Distributions 1969-1980.
Working paper,
Norman L. Johnson, and Samuel Kotz. Sep 81, 24p
Rept no. MS/S-81-034
Contract N00014-81-K-0301
Prepared in cooperation with North Carolina Univ. at Chapel Hill.

In this paper we survey and summarize developments in theory and methodology of discrete distributions during the period 1969-1980 since publication of our book Distributions in Statistics-Discrete Distributions (Wiley, 1969). A comprehensive (though not exhaustive) bibliography of some 400 items is included. (Author)

AD-A106 981/4 PC **A02**/MF **A01**
Maryland Univ., College Park. Dept. of Mathematics.
Final Scientific Report.
Rept. for 15 Mar 80-31 Aug 81,
Benjamin Kedem. 1980, 9p AFOSR-TR-81-0718
Grant AFOSR-80-0211

In this effort further study was made of the implication of the higher order crossings on stationary time series and homogeneous random fields. The Higher Order Crossings Theorem has been extended to homogeneous random fields and the psi-square first introduced in the literature by the principal investigator has been further studied. In particular, since the Higher Order Crossings Theorem can be extended to random fields this suggests that psi-square can be used in texture discrimination which is indeed the case. The investigators have studied the power of psi-square via simulation techniques of series and fields. As the alternative becomes more distinguishable so is the increase in the power as expected. Another aspect studied is graphics in the series analysis. There is no theory of graphics as such, but the investigators were able to prove various graphical results by clipping a series by a random curve. In thic connection the investigators did some work in which the notion of a unit has been advanced in connection with the appearance of binary sequences. (Author)

AD-A106 983/0 PC **A07**/MF **A01**
Illinois Univ. at Urbana-Champaign. Coordinated Science Lab.
Annual Progress Report.
Rept. for 1 Oct 80-30 Sep 81,
H. Vincent Poor. 20 Oct 81, 132p Rept no. T-111
Contract N00014-81-K-0014

This report includes several results in minimax linear estimation and control as well as results for general minimax hierarchical games and minimax jamming strategies.

AD-A107 011/9 Not available NTIS
California Inst. of Tech., Pasadena.
Two New Bifurcation Phenomena,
Herbert B. Keller. 1981, 14p ARO-15622.26-M
Contracts DAAG29-78-C-0011, EY-76-S-03-0767
Availability: Pub. in Applications on Non-Linear Analysis in the Physical Sciences, p60-73 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 018/4 Not available NTIS
Maryland Univ. Baltimore County, Baltimore. Dept. of Mathematics.
On the Optimal Solution of the One-Armed Bandit Adaptive Control Problem,
P. R. Kumar, and Thomas I. Seidman. 10 Apr 81, 11p ARO-17311.6-M, ARO-14092.15-M
Contracts DAAG29-80-K-0038, DAAG29-79-C-0064
Sponsored in part by Grant DAAG29-80-K-0038.
Availability: Pub. in IEEE Transactions on Automatic Control, vAC-26 n5 p1176-1184 Oct 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 031/7 PC **A02**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Electrical Engineering.
Spectral Estimation Technology.
Final rept. 30 Jun-31 Aug 81,
James A. Cadzow. 25 Sep 81, 6p AFOSR-TR-81-0709
Grant AFOSR-81-0236

During the two months period of this grant, the principle investigator and his graduate research assistant developed an adaptive method for optimally updating the autoregressive coefficients of the autoregressive - moving average (ARMA) model as new observations are made available. This updating algorithm is predicted on making use of a 'restricted' set of Yule-Walker equations which governs the ARMA model's time domain description. This algorithm will be dependent on a projection operator formulation. (Author)

AD-A107 050/7 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Circular and Extended Circular Harmonic Transforms and Their Relevance to Image Reconstruction from Line Integrals.
Journal article,
Jacques G. Verly. 29 Nov 80, 12p JA-5197, ESD-TR-81-265
Contract F19628-80-C-0002
Pub. in Jnl of the Optical Society of America, v71 n7 p825-835 Jul 81.

No abstract available.

AD-A107 109/1 PC **A02**/MF **A01**
Massachusetts Univ., Amherst. Dept. of Mathematics and Statistics.
Rank Correlation Coefficients as Optimality Measures for Ordinal Cluster Methods.
Technical rept.,
M. F. Janowitz. May 81, 25p Rept no. TR-J8101
Contract N00014-79-C-0629

Use and misuse of rank correlation coefficients as optimality measures for cluster analysis is investigated. Distributions of some of the more common dissimilarity coefficients on random binary data are established. The distributions of certain rank correlation coefficients between input and output of cluster methods is also investigated for random input data. A statistical model is proposed to deal with this type of question. (Author)

AD-A107 111/7 PC **A02**/MF **A01**
Massachusetts Univ., Amherst. Dept. of Mathematics and Statistics.
A Model for Ordinal Nonhierarchical Cluster Methods.
Technical rept.,

M. F. Janowitz. Sep 81, 21p Rept no. TR-J8103
Contract N00014-79-C-0629

Hierarchical clustering involves the creation of a nested sequence of partitions of a set, whereas nonhierarchical clustering deals with a single partition. Nonhierarchical cluster techniques come up in a variety of situations involving such items as: (i) the assignment of stars to galaxies, (ii) the assignment of grades to students by an instructor; (iii) the classification of psychiatric patients by diagnostic type; (iv) the classification of rock formations: (v) the interpretation of LANDSAT images; (vi) automatic target detection; (vii) the grouping of companies according to properties that their stock might have in the stock market. It is not our purpose here to survey the literature in this area - rather, the reader is referred to standard references. As in our earlier model for hierarchical clustering, the viewpoint here will be that the input data has only ordinal significance. The order theoretic properties of the resulting model are offered in Section 2 and it will be related to some earlier theoretical work in Section 3. Finally, Section 4 presents an abstract characterization of the model in terms of semiBoolean algebras.

AD-A107 144/8 Not available NTIS
Wayne State Univ., Detroit, MI. Dept. of Mathematics.
Weak Compactness of Solution Measures Associated with Random Equations,
A. T. Bharucha-Reid. 1981, 12p ARO-15016.8-M
Grant DAAG29-77-G-0164
Proceedings of the International Conference on Probability in Banach Spaces (3rd) Held at Tufts Univ., Medford, MA, 4-16 Aug 80.
Availability: Pub. in Lecture Notes in Mathematics, v860 p25-34 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 275/0 Not available NTIS
California Univ., Berkeley.
An Exact Penalty Function Algorithm for Optimal Control Problems with Control and Terminal Equality Constraints. Part 1,
D. Q. Mayne, and E. Polak. 1980, 37p ARO-11260.14-M
Contract DAAG29-73-C-0025, Grant NSF-ENG73-08214
Prepared in cooperation with Imperial Coll. of Science and Technology, London (England). Dept. of Computing and Control.
Availability: Pub. in Jnl. of Optimization Theory and Applications, v32 n2 p211-246 Oct 80 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 352/7 PC **A02**/MF **A01**
Naval Ocean Systems Center, San Diego, CA.
Maximum Likelihood Estimation of Magnitude-Squared Coherence.
Interim technical rept. Apr-Jun 81,
G. L. Mohnkern. 24 Aug 81, 16p Rept no. NOSC/TR-717

A maximum likelihood estimator (MLE) for coherence is derived. The MLE should be unbiased, and there should be no unbiased estimator with smaller variance. An approximation to the MLE, valid for coherence estimates with high degrees of freedom (dof), is also calculated. The two MLE algorithms and two estimators discussed in earlier literature are compared in a simulation of 8192 Calculators of coherence estimates with eight dof. The MLE calculations are consistently closer to the design coherences than the other estimators. The approximation to the MLE performs suprisingly well, considering the coherence estimates have only eight dof. (Author)

AD-A107 364/2 PC **A04**/MF **A01**
Missouri Univ.-Columbia. Tailored Testing Research Lab.
A Comparison of Procedures for Constructing Large Item Pools.
Research rept.,
Robert L. McKinley, and Mark D. Reckase. Aug 81, 64p Rept no. RR-81-3
Contract N00014-77-C-0097

The purpose of this study was to investigate the properties of available procedures for linking item parameter estimates. The properties investigated included sample size requirements, overlap requirements, and drift. From the analyses of these properties reported, the following conclusions were reached. When large sample sizes were employed, the use of LOGIST a-values with any of the procedures appeared to yield adequate results. The same was true for the linking of b-values using the 3PL model. The best combination for linking b-values was the use of LOGIST b-values with any of the linking procedures. When small sample sizes were used for the linking of a-values the best results were obtained using the major axis and least square procedures with either the ANCILLES or LOGIST a-values. Again, the results were the same for small sample size linking of b-values. The linking results using the small sample sizes were not as satisfactory as the results obtained using large sample sizes. The small sample sizes appeared to be inadequate for both a-value and b-value linking using the 3PL model. For the linking of 1PL b-values a sample size of 100 appeared adequate. Level of overlap did not seriously affect the results of linking for any of the procedures. However, it did appear that five items probably was not adequate. For the 15 and 25 item overlaps the results were quite similar, indicating that 15 items is probably sufficient overlap.

AD-A107 430/1 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Lab. for Computer Science.
On the Expressive Power of Dynamic Logic. II,
Joseph Y. Halpern. Aug 81, 16p Rept no. MIT/LCS/TM-204
Grant NSF-MCS80-10707
Prepared in cooperation with Harvard Univ., Cambridge, Aiken Computation Lab.

In this paper we study the expressive power of nondeterminism in dynamic logic. In particular, we show that first order regular dynamic logic without equality (hereafter abbreviated DL) is more expressive than its deterministic counterpart (DDL). This result has already been shown for the quantifier-free case (MW) and for the propositional case (HR). Berman and Tiuryn have recently extended the present result to the case with equality. By contrast, Meyer and Tiuryn have shown in (MT) that in the r.e. case, deterministic and nondeterministic dynamic logic coincide. The proof hinges on showing that in a precise sense a deterministic regular program cannot search a full binary tree. Because of this, the truth of a first-order DDL formula, even with first-order quantification, cannot depend on every value in a full binary tree. From this it will follow that DDL is less expressive than DL. The kernel of the proof presented here can already be found in (HR). (Author)

AD-A107 464/0 Not available NTIS
Association for Computing Machinery, New York.
Proceedings of the ACM Symposium on Symbolic and Algebraic Computation (1981), Snowbird, Utah, 5-7 August 1981.
Final rept.,
Paul S. Wang. Nov 81, 258p ARO-18354.1-M
Contract DAAG29-81-M-0120
Availability: ACM Order Department, P. O. Box 64145, Baltimore, MD 21264 (No copies furnished by DTIC).

SYMSAC '81 is the continuation of a well-established series of conferences sponsored or co-sponsored by ACM SIGSAM for the presentation of the latest advances in the field of symbolic and algebraic computation. The program consists of three invited talks, an invited banquet address, the presentation of thirty-nine submitted papers, two one-hour poster sessions, and demonstrations of various computer algebra systems. In addition, the Program Committee made a conscious effort to provide ample time and facilities for the informal exchange of ideas among the attendees.

AD-A107 492/1 PC **A02**/MF **A01**
University of Southern California, Los Angeles. Dept. of Mathematics.
Qualitative Properties of Differential Equations.
Final rept. 15 Oct 76-30 Jun 80,
H. A. Antosiewicz, W. A. Harris, Jr., and R. J. Sacker. 22 Oct 81, 6p ARO-14283.1-M
Grant DAAG29-77-G-0005

Research was carried out in several broad areas: existence theory for generalized differential equations and general linear boundary value problems for non linear differential equations; singular perturbation problems and the theory of asymptotic integration; and dynamical systems and skew-product flows. (Author)

AD-A107 520/9 PC **A03**/MF **A01**
Brown Univ., Providence, RI. Lefschetz Center for Dynamical Systems.
Approximation of Processes and Applications to Control and Communication Theory,
Harold J. Kushner. Jun 81, 32p Rept no. LCDS-81-18
Contract N00014-76-C-0279, Grant AFOSR-76-3063
Sponsored in part by Grant NSF-ENG77-12946.

Diffusion models are useful and of widespread use in many areas of control and communication theory. The models are frequently used for systems that are not quite diffusions but are, hopefully, close to a diffusion in some sense. E.g., the input noise might be 'wideband'--but not 'white-Gaussian.' Many approximation techniques have been developed, under different sets of assumptions. The typical results are of a weak convergence nature. The physical process (x (to the epsilon power) (.)) is parameterized by the parameter epsilon, and one tries to show that (x (to the epsilon power) (.)) converges weakly to some diffusion x(.) as epsilon goes to 0. The limit process x(.) is then used to study various properties of x (to the epsilon power) (.) for small epsilon.

DE82000147 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Determination of the Statistical Distributions of Model Parameters for Probabilistic Risk Assessment.
D. E. Fields, and S. R. Glandon. 1981, 11p CONF-810905-7
Contract W-7405-ENG-26
ANS/ENS topical meeting on probabilistic risk assessment, Post Chester, NY, USA, 20 Sep 1981.

Successful probabilistic risk assessment depends heavily on knowledge of the distribution of model parameters we have developed. The TERPED computer code is a versatile methodology for determining with what confidence a parameter set may be considered to have a normal or lognormal frequency distribution. Several measures of central tendency are computed. Other options include computation of the chi-square statistic, the Kolmogorov-Smirnov non-parametric statistic, and Pearson's correlation coefficient. Cumulative probability plots are produced either in high resolution (pen-and-ink or film) or in printerplot form. (ERA citation 06:035525)

JINR-R-5-11595 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
PR-Algebras.
V. M. Lebedenko. 1978, 6p
In Russian.
U.S. Sales Only.

The PR-algebras, i.e. the Lie algebras with commutation relations of (Hsub(i),Hsub(j)) = rsub(ij)Hsub(i)(i<j) type are investigated. On the basis of former results a criterion for the membership of 2-solvable Lie algebras to the PR-algebra class is given. The conditions imposed by the criterion are formulated in the linear algebra language. (Atomindex citation 10:438561)

LA-UR-80-2342 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Block Relaxation Strategies.
V. Faber. 1980, 6p CONF-800699-2
Contract W-7405-ENG-36
Elliptic problem solvers conference, Santa Fe, NM, USA, 30 Jun 1980.

It is desired to solve the linear system Ax = b, where the matrix A is n x n block tridiagonal with block size m. This system is to be solved by block line relaxation when the largest block problem with block size m that can be cheaply solved directly is l x l. Iteration steps, strategies, and results are summarized. It is concluded that the convergence rate of some block relaxation strategies is much faster than that of the strategies generally used. (ERA citation 05:034445)

NUREG/CR-2313 PC **A03**/MF **A01**
Argonne National Lab., IL.
Boundary-Fitted Coordinate Transformation for Thermohydraulic Analysis in Arbitrary Three-Dimensional Geometries,
William T. Sha. Sep 81, 45p ANL-81-54

In order to solve the Navier-Stokes and energy equations, it is essential that the boundary conditions are represented accurately since the regions in the immediate vicinity of a boundary usually exhibit large temperature and velocity gradients, and these large gradi-

ents must be accurately accounted for. Most practical engineering problems involve body shapes that do not lend themselves to any one of the Cartesian, cylindrical or spherical coordinate representations. A method using boundary-fitted coordinate transformation is presented. It has the capability to transform arbitrary 3-D geometries in a physical domain to either a rectangular or cylindrical shape in the transformed space. The unique advantage of this transformation is that all physical boundaries are coincident with the computational grids; thus, it will give an accurate and efficient numerical solution to the Navier-Stokes and energy equations. A procedure for coordinate generation is outlined, and the transformed Navier-Stokes and energy equations with corresponding initial and boundary conditions are also presented.

N81-29498/5 PC **A02**/MF **A01**
Lockheed Engineering and Management Services Co., Inc., Houston, TX.
The Multicategory Case of the Sequential Bayesian Pixel Selection and Estimation Procedure.
M. D. Pore, and T. B. Dennis. Nov 80, 22p E81-10182, NASA-CR-160965
Contracts NAS9-15800, PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of Interior, and Agency for International Development. Erts.

A Bayesian technique for stratified proportion estimation and a sampling based on minimizing the mean squared error of this estimator were developed and tested on LANDSAT multispectral scanner data using the beta density function to model the prior distribution in the two-class case. An extention of this procedure to the k-class case is considered. A generalization of the beta function is shown to be a density function for the general case which allows the procedure to be extended.

N81-29502/4 PC **A04**/MF **A01**
Lockheed Engineering and Management Services Co., Inc., Houston, TX.
Maximum Likelihood Clustering with Dependent Feature Trees.
C. B. Chittineni. Jan 81, 54p E81-10186, NASA-CR-160939
Contracts NAS9-15683, PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of the Interior, and Agency for International Development. Erts.

The decomposition of mixture density of the data into its normal component densities is considered. The densities are approximated with first order dependent feature trees using criteria of mutual information and distance measures. Expressions are presented for the criteria when the densities are Gaussian. By defining different typs of nodes in a general dependent feature tree, maximum likelihood equations are developed for the estimation of parameters using fixed point iterations. The field structure of the data is also taken into account in developing maximum likelihood equations. Experimental results from the processing of remotely sensed multispectral scanner imagery data are included.

N81-29510/7 PC **A03**/MF **A01**
Lockheed Engineering and Management Services Co., Inc., Houston, TX.
Estimation of Proportions in Mixed Pixels Through Their Region Characterization.
C. B. Chittineni. Mar 81, 38p E81-10199, NASA-CR-161001
Contracts NAS9-15800, PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of the Interior, and Agency for International Development. Erts.

A region of mixed pixels can be characterized through the probability density function of proportions of classes in the pixels. Using information from the spectral vectors of a given set of pixels from the mixed pixel region, expressions are developed for obtaining the maximum likelihood estimates of the parameters of probability density functions of proportions. The proportions of classes in the mixed pixels can then be estimated. If the mixed pixels contain objects of two classes, the computation can be reduced by transforming the spectral vectors using a transformation matrix that simultaneously diagonalizes the covariance matrices of the two classes. If the proportions of the classes of a set of mixed pixels from the region are given, then expressions are developed for obtaining the estmates of the parameters of the probability density function of the proportions of mixed pixels. Development of these expressions is based on the criterion of the minimum sum of squares of errors. Experimental results from the processing of remotely sensed agricultural multispectral imagery data are presented.

N82-11826/6 PC **A02**/MF **A01**
National Aerospace Lab., Tokyo (Japan).
A Second-Order Accurate Procedure for Solving the Boundary Layer Equations Based on the Predictor-Corrector Form of the Crank-Nicolson Scheme.
K. Matsuno. 1981, 10p NAL-TR-655, ISSN-0389-4010
In Japanese; English Summary.

The numerical accuracy of a predictor corrector form of the Crank-Nicolson scheme for solving boundary layer equations was investigated. A predictor corrector form of the Crank-Nicolson Scheme, based on a coupled algorithm for the continuity and the momentum equations, is presented for both the incompressible and the compressible flows. This scheme was subjected to a computer experiment by use of the problem of the laminar boundary layer development in a linearly retarded edge velocity field, and compared with another coupled scheme. It is shown that the present scheme posesses second-order accuracy and is very efficient.

N82-11833/2 PC **A02**/MF **A01**
Myers (Raymond H.), Blacksburg, VA.
Methods for Presentation and Display of Multivariate Data.
R. H. Myers. Sep 81, 18p NASA-CR-165788
NASA ORDER L-72497-A

Methods for the presentation and display of multivariate data are discussed with emphasis placed on the multivariate analysis of variance problems and the Hotelling T(2) solution in the two-sample case. The methods utilize the concepts of stepwise discrimination analysis and the computation of partial correlation coefficients.

N82-11834/0 PC **A05**/MF **A01**
Myers (Raymond H.), Blacksburg, VA.
Applications of Non-Parametric Statistics and Analysis of Variance on Sample Variances.
R. H. Myers. Sep 81, 98p NASA-CR-165789
NASA ORDER L-72497-A

Nonparametric methods that are available for NASA-type applications are discussed. An attempt will be made here to survey what can be used, to attempt recommendations as to when each would be applicable, and to compare the methods, when possible, with the usual normal-theory procedures that are avavilable for the Gaussian analog. It is important here to point out the hypotheses that are being tested, the assumptions that are being made, and limitations of the nonparametric procedures. The appropriateness of doing analysis of variance on sample variances are also discussed and studied. This procedure is followed in several NASA simulation projects. On the surface this would appear to be reasonably sound procedure. However, difficulties involved center around the normality problem and the basic homogeneous variance assumption that is mase in usual analysis of variance problems. These difficulties discussed and guidelines given for using the methods.

PB82-131772 PC **A03**/MF **A01**
Purdue Univ., Lafayette, IN. School of Civil Engineering.
Inference Procedure with Uncertainty for Problem Reduction Method,
M. Ishizuka, K. S. Fu, and J. T. P. Yao. Aug 81, 43p CE-STR-81-24, NSF/CEE-81039
Grant NSF-PFR79-06296

In the application of artificial intelligence to complex decisionmaking problems, a decisionmaking tree is employed. Rational inference procedures for problem reduction are described which are based on either Bayes' theory or Dempster and Shafer's theory. At each branch of the decision tree, a probability is assigned to the evidence at that branch. In the Bayesian system, if there is a 75 percent probability that the evidence is true, for example, then there must be a 25 percent probability that the evidence is false. The Dempster and Shafer system allows for ignorance of evidence. A modification of the Bayesian, and Dempster and Shafer systems is presented which includes fuzzy reasoning, an approximate reasoning process which is compatible with human intuitions, and can yield a plausible answer even for problems in which all conditions for mathematical approaches are not satisfied. Fuzzy reasoning is presented as an alternative to statistical approaches in problem reduction.

PB82-133109 PC **A02**/MF **A01**
National Inst. for Metallurgy, Randburg (South Africa).
Five Robust Indicators of Central Value,
P. J. Ellis. 14 Aug 81, 23p NIM-2121, ISBN-0-86999-549-9

The presence of outliers and the statistical noise that affects the data for reference materials have undesirable effects on the mean and on other indicators of the central value. Five robust indicators of the central value, which are resistant to obvious outliers and less obvious contamination (spurious data), were investigated: the dominant cluster mode, the modian, the Gastwirth median, the trimean, and the trimmed mean. The mean and the median were investigated for purposes of comparison. The results confirm that the mean is very unreliable, and that the Gastwirth median and the dominant cluster mode are strong indicators of the central value.

PB82-134487 PC **A03**/MF **A01**
Pacific Southwest Forest and Range Experiment Station, Berkeley, CA.
POLO2: A User's Guide to Multiple Probit or LOgit Analysis.
General technical rept. (Final),
Robert M. Russell, N. E. Savin, and Jacqueline L. Robertson. Sep 81, 44p FSGTR-PSW-55

This guide provides instructions for the use of POLO2, a computer program for multivariate probit or logit analysis of quantal response data. As many as 3000 test subjects may be included in a single analysis. Including the constant term, up to nine explanatory variables may be used. Examples illustrating input, output, and uses of the program's special features for hypothesis testing are included.

PB82-134578 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
Recursive System Identification Using Fast Algorithms,
A. J. Robins, and P. E. Wellstead. Sep 79, 39p
CONTROL SYSTEMS CENTRE-459

This article shows how the class of so-called 'fast' (i.e. computationally efficient) estimation algorithms can be used in system identification. Commencing with a simplified derivation of a fast recursive parameter estimator, the discussion continues to cover the following points: The use of fast algorithms for the general model structures encountered in system identification from input/output data; The computational advantages and disadvantages of these allegedly computationally efficient methods; The theoretical basis for fast instrumental variable algorithms; and, The initialization and use of exponential memories in fast recursions. The article continues with practical examples of 'fast' identifiers at work in the least squares form (applied to feedback systems) and in the instrumental variable form.

PB82-134610 PC **A04**/MF **A01**
Cambridge Univ. (England). Dept. of Engineering.
Optimization of Stochastic Relay Control Systems by Means of Dimensional Analysis,
A. T. Fuller. 1981, 73p CUED/F-CAMS/TR-216-1981
Also pub. as ISSN-0309-765X.

Optimal feedback control is investigated for a second-order plant with white noise disturbances and with bounded control. The white noises are state-dependent, and the system is such that dimensional analysis can be applied with advantage. The optimal controller is found to be represented by a switching curve which is determined analytically to within a single parameter. To find the value of this parameter, the Bellman-Florentin partial differential equation of optimal stochastic control is converted to an ordinary differential equation by means of dimensional analysis, and a resulting two-point boundary-value problem is solved numerically.

PB82-134784 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.

Interactive Maximum Likelihood Estimation,
D. L. Prager, and P. E. Wellstead. Aug 79, 41p
CONTROL SYSTEMS CENTRE-458

This report describes an approach to maximum likelihood estimation which is based upon recursive hypothesis testing. The advantage of the method over existing hill-climbing and approximate recursive methods lies in the degree of information which can be obtained from the algorithm. In particular, cross-sections through the loss function are provided in a graphical form. This allows the analyst to see the likelihood function evolve, and make subjective decisions based upon this information. Effectively, the method computes all the relevant points on the loss function surface, making the technique ideal for short data runs where conditioning of the likelihood function is a problem. The method compares favorably with alternative maximum likelihood algorithms in terms of computational effort, and has none of their convergence problems.

PB82-134800 PC **A02**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
Computation of Abscissa of Stability by Repeated Use of the Routh Test,
V. Zakian. Jan 78, 12p CONTROL SYSTEMS CENTRE-441

The numerical computation of the abscissa of stability of a polynomial, defined as the largest of the real parts of the zeros of the polynomial, is a problem that occurs repeatedly in computer aided design of dynamical and control systems. When the polynomial has a large number of zeros or is ill-conditioned, computing all the zeros is expensive or difficult. The approach developed in this paper, by making repeated use of the Routh test, avoids the computation of zeros and provides a method which is economical and reliable.

PB82-135625 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
New Formulations for the Method of Inequalities,
V. Zakian. Jan 79, 31p CONTROL SYSTEMS CENTRE-437

A new version of the method of inequalities is developed for the design of feedback control systems that have non-linear and multivariable characteristics and are subject to disturbances. The system is required to behave in accordance with a criterion which takes the form of a prescribed bound on each component of the error vector.

PB82-135674 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
Multivariable Pole Assignment Self Tuning Regulators,
D. L. Prager, and P. E. Wellstead. Apr 79, 31p
CONTROL SYSTEMS CENTRE-452

The paper describes the theory and application of a multi-input/multi-output self-tuning regulator where the control objective is the assignment of the closed-loop pole set to prespecified locations. The key theoretical result is that the algorithm has the so-called 'self-tuning' property. From a practical viewpoint, the pole-assignment concept leads to direct digital controllers which are more robust than self-tuners based upon optimal control synthesis methods.

PB82-135682 PC **A02**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
On the Behaviour of Dynamical Systems Subject to Bounded Disturbances,
P. A. Cook. May 79, 20p CONTROL SYSTEMS CENTRE-454

For the problem of obtaining bounds on the outputs of a system when the inputs satisfy known constraints, two methods, using impulse responses and Lyapunov functions, are considered and compared.

PB82-802448 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Control Theory. August, 1978-July, 1980 (Citations from the NTIS Data Base).
Rept. for Aug 78-Jul 80.
Dec 81, 275p

Recent research reports are cited on automatic control, stochastic control, and feedback control, with multidisciplinary applications. Stabilization, optimization, and control of linear and nonlinear systems are included. (This updated bibliography contains 266 citations, none of which are new entries to the previous edition.)

PB82-802455 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Control Theory. August, 1980-November, 1981 (Citations from the NTIS Data Base).
Rept. for Aug 80-Nov 81.
Dec 81, 180p
Supersedes PB80-814395, and NTIS/PS-79/0933.

Recent research reports are cited on automatic control, stochastic control, and feedback control, with multidisciplinary applications. Stabilization, optimization, and control of linear and nonlinear systems are included. (This updated bibliography contains 174 citations, all of which are new entries to the previous edition.)

PB82-859018 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Number Theory. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for Jan 75-Dec 81.
Dec 81, 217p

This bibliography covers number theory as encountered in different branches of mathematics, and number theory results as applied in various other disciplines such as physics, computer science, etc. Concepts, proofs, methods, manipulations, and properties of many kinds of numbers and number systems are considered. Much attention is given to prime numbers. (Contains 266 citations fully indexed and including a title list.)

PB82-859414 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computerized Three-Dimensional Finite Element Analysis. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 133p
Supersedes PB81-856684. Prepared in cooperation with the Department of Energy, Washington, DC.

Citations in this bibliography cover computerized simulation, mathematical modeling, computer codes, and calculations used in three-dimensional finite element analysis of stresses, structures, reactor kinetics, and the mechanics of fluids, soils, and rocks. The analysis relates chiefly to energy facilities and equipment or apparatus. (This updated bibliography contains 117 citations, 37 of which are new entries to the previous edition.)

12B. Operations Research

AD-A107 085/3 Not available NTIS
Yale Univ., New Haven, CT. Cowles Foundation for Research in Economics.
Value Theory without Efficiency,
Pradeep Dubey, Abraham Neyman, and Robert James Weber. 21 Feb 79, 11p Rept no. FOUNDATION PAPER-528
Prepared in cooperation with California Univ., Berkeley. Dept. of Mathematics and Northwestern Univ., Evanston, IL. J. L. Kellogg Graduate School of Management.
Availability: Pub. in Mathematics of Operations Research, v6 n1 p122-128 Feb 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 202/4 PC **A10**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
The Single and Multiple Vehicle Pickup and Delivery Problem: Exact and Heuristic Algorithms.
Doctoral thesis,
Gerald R. Armstrong. Jun 81, 201p Rept no. AFIT-CI-81-50D

The pickup and delivery problem (PUDP) represents a class of sequencing or routing problems where the key facet of the routing is that a pickup must precede the corresponding, subsequent delivery. Other considerations such as service time windows, quality of service parameters or operational constraints on either the driver or the vehicle are possible. As such, the PUDP is a constrained version of the ubiquitous travelling salesman problem (TSP), which seeks a minimum cost route that from an initial point visits each city or stop once and only once, ending at the initial stop. There are also similarities between the PUDP and the much studied vehicle routing problem (VRP), although the two problems are distinctly different because of the origin preceding destination requirement.

AD-A107 461/6 PC **A06**/MF **A01**
Stanford Univ., CA. Systems Optimization Lab.
Variable Metric Relaxation Methods. Part I. A Conceptual Algorithm.
Technical rept.,
Jean-Louis Goffin. Aug 81, 103p Rept no. SOL-81-16
Contracts N00014-75-C-0267, DE-AM03-76SF00326
Sponsored in part by Contract De-AT03-76ER72018 and Grants NSF-MCS76-81259, NSF-MCS79-26009.

A variable metric, maximal ellipsoidal distance, relaxation method for solving systems of linear inequalities is described and its rate of convergence analyzed. This algorithm, with a termination routine appended to it, is polynomial if the ellipsoid matrix approximates an inverse 'Hessian,' which may be defined through the largest ellipsoid contained in a perturbation cum compactification of the feasible set. This so called inverse Hessian is given by a positive linear combination of symmetric rank one matrices built on the vectors given by the facets of the perturbation compactification of the feasible set. (Author)

PB82-140633 (Order as PB82-140575, PC **A05**/MF **A01**)
Florida Univ., Gainesville. Dept. of Industrial and Systems Engineering.
A 'Uniformity Principle' for Evacuation Route Allocation,
Richard L. Francis. 1 Apr 81, 5p
Included in Jnl. of Research of the National Bureau of Standards, v86 n5 p509-513, Sep-Oct 81.

This paper establishes what might be called a 'uniformity principle' for building evacuation problems. The principle may be stated as follows: given a building for which each occupant has reasonable access to every evacuation route, if the building is evacuated in minimum time, then the allocation of evacuees to routes is such that the route evacuation times are all the same. That is, there is a uniformity of route evacuation times. Also, analytical expressions for the minimum time to evacuate a building, and for the corresponding allocation of evacuees to routes, are obtained.

13.

MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

AD-A106 900/4 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Energy-Efficient and Cost-Effective Equipment Should be Installed in New Government Housing.
16 Sep 81, 29p Rept no. GAO/EMD-81-93

This report discusses the efforts being made and the actions that could be taken to make Government housing more energy efficient. For the purpose of this report, Government housing is defined as that which is either entirely owned or assisted through direct subsidies, such as below-market interest rates, and housing financed by Government guaranteed or insured loans. Residential energy consumption accounts for about 20 percent of the Nation's energy use. Studies have shown that heating and cooling equipment, including water heaters, account for as much as 70 percent of the energy consumed in a house. Conservation efforts have concentrated on the thermal envelope (e.g., insulation, storm windows and doors, and infiltration) of new houses with little attention focused on the energy efficiency of equipment that provides needed space heating, air conditioning, and water heating. although most housing is privately financed and developed without Federal assistance in developing and financing new housing, can have a significant influence on reducing residential energy consumption. Under programs administered by the Department of Housing and Urban Development (HUD), the Veterans Administration (VA), the Farmers Home Administration (FmHA), and the Department of Defense (DOD), energy conservation practices can be fostered in Government owned, subsidized, and insured housing. HUD administers a variety of programs to help meet the Nation's need for decent housing for all Americans. During the last few years, HUD's single-family home mortgage programs have averaged approximately 100,000 new home starts each year.

AD-A107 232/1 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Sputtered Films for Wavelength-Selective Applications.
Journal article,
John C. Fan. 1981, 13p JA-5251, ESD-TR-81-269
Contract F19628-80-C-0002
Pub. in Thin Solid Films, v80 p125-136 1981. Presented at the International Conference on Ion and Plasma Assisted Techniques (3rd), 30 Jun-2 Jul 81, Amsterdam (Netherlands).

No abstract available.

AD-A107 363/4 PC **A06**/MF **A01**
Carnegie-Mellon Univ., Pittsburgh, PA. Dept. of Mechanical Engineering.
Boiling Heat Transfer in Confined Space.
Annual technical rept. 1 Aug 80-1 Aug 81,
Shi-Chune Yao. Oct 81, 105p
Contract N00014-79-C-0623

In many equipments, boiling occurs in confined space such as the clearance between the tube and the support plate of steam generators. Corrosive concentration builds up at the boundary of dryout zone and induces severe damage. The knowledge on this kind of boiling phenomena is very limited. It is the objective of this research to understand this fundamental heat transfer of this problem through systematical analysis and experimental studies. This report covers the following aspects of the boiling in confined space: (1) Analysis of single phase forced convection in support plate crevices; (2) Analysis of convective boiling and dryout in support plate crevices; (3) Experiments of boiling and dryout in annular crevices with closed bottom; and (4) Experiments of convective boiling and dryout in annular crevices. (Author)

AD-A107 454/1 PC **A09**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Design Model for the Heat Transfer in a Short Straight Tube Boiler.
Master's thesis,
Leo W. Vollmer, Jr. Jun 81, 182p

A design model for the Short Straight Tube Boiler with a segmented fin-tube arrangement was developed. This model was integrated for a single tube applied in a computer program written in BASIC for the Hewlett Packard 9845 model B desk-top computer. Water-side Reynolds numbers were varied in order to investigate the performance of this boiler. For an overall tube length of 39.4 inches, a Reynolds number of 840 (29.65 lbm/hr) resulted in obtaining 50 deg superheat for an operating pressure of 600 psig. With these conditions, saturated boiling begins at 11.45 inches and superheating at 21.88 along the tube length. (Author)

DE81014880 PC **A10**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Agricultural Engineering.
Solar Energy for Livestock Production: Dairy, Swine, Poultry.
1978, 218p CONF-7811183-
Conference on solar energy for livestock production, College Park, MD, USA, 28 Nov 1978.

Fourteen papers are included. A separate abstract was prepared for each one. (ERA citation 06:034582)

DE81025726 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Reducing Conventive Losses from Cover Glazings of Solar-Thermal Collectors.
P. Raghuraman, and D. Kon. 1981, 8p DOE/ET/20279-146, CONF-811101-9
Contract AC02-76ET20279
Winter annual meeting of the ASME Technology and Society Division, Washington, DC, USA, 15 Nov 1981.

Convective heat losses from cover glazings of solar thermal collectors are reduced by forming perpendicular crisscross rectangular grooves on the glazing which cause the air flow to form recirculating zones in the grooves. Experiments on the effects of varying groove geometry show that the cover-glazing convective heat-transfer coefficient can be reduced by a factor of four or better. Results of the experimental and analytical work and a description of the design considerations in optimizing the groove geometry are presented. (ERA citation 06:034621)

DE81030213 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Simple Computer Program to Model 3-Dimensional Underground Heat Flow with Realistic Boundary Conditions.
P. D. Metz. 1981, 13p BNL-29776, CONF-811101-11
Contract AC02-76CH00016
Winter annual meeting of the ASME Technology and Society Division, Washington, DC, USA, 15 Nov 1981.

A FORTRAN computer program called GROCS (GRound Coupled Systems) has been developed to study 3-dimensional underground heat flow. Features include the use of up to 30 finite elements or blocks of earth which interact via finite difference heat flow equations and a subprogram which sets realistic time and depth dependent boundary conditions. No explicit consideration of moisture movement or freezing is given. GROCS has been used to model the thermal behavior of buried solar heat storage tanks (with and without insulation) and serpentine pipe fields for solar heat pump space conditioning systems. The program is available independently or in a form compatible with specially written TRNSYS component TYPE subroutines. The approach taken in the design of GROCS, the mathematics contained and the program architecture, are described. Then, the operation of the stand-alone version is explained. Finally, the validity of GROCS is discussed. (ERA citation 06:034566)

DE81030496 PC **A05**/MF **A01**
Madison Industries, Inc., Conyers, GA.
Passive Design for a Manufactured Classroom Building. Final Report.
31 Mar 81, 88p DOE/CS/30375-T1
Contract FC02-80CS30375

Work conducted by Madison Industries Inc. of Georgia and the Georgia Institute of Technology Engineering Experiment Station toward the development of passive solar heating systems for manufactured buildings is summarized. The specific application is a modular classroom building. Four passive system concepts were selected for space heating. These concepts are as follows: (1) direct gain; (2) water wall; (3) sunspace; and (4) integral collector wall. Designs were prepared for all four concepts. Thermal analyses were conducted, including annual heating simulations, for all designs. Typical weather and solar data for Atlanta were used in the simulations. In addition, design features for daylighting were incorporated in the building. (ERA citation 06:034596)

DE81030947 PC **A10**/MF **A01**
Iowa Solar Office, Des Moines.
Passive Solar Working for You Naturally: Information Manual.
220p DOE/CS/30156-T1
Contract AC02-79CS30156

The elements of energy efficient house design are presented, and passive solar components and systems are discussed, including fan-assisted passive systems and passive cooling. Modifying existing residences for energy conservation, and passive and active solar retrofitting are discussed. Some construction details and financial considerations are described. Included are lists of sources for passive solar house plans, manufacturers of movable insulating products, and Iowa solar industry professionals and installations. (ERA citation 06:034536)

DE81904251 PC **A05**/MF **A01**
C-E Power Systems, Windsor, CT.
Steam Generator Chemical Cleaning: Demonstration Test No. 2 in a Pot Boiler.
G. L. Key, G. C. Fink, and M. H. Helyer. Aug 81, 91p EPRI-NP-1976

The effectiveness of the EPRI Mark II chemical cleaning solvent process was tested utilizing a 4-tube pot boiler that had previously been fouled and dented under 81 days of high chloride fault chemistry operation. One laboratory cleaning demonstration of 94.25 hours was performed. Essentially all of the low copper content (approximately 5%) sludge was removed. Approximately 38% of the previously fouled and dented tube/ring and tube/support crevice regions were effectively cleaned. Severe localized corrosion (predominantly pitting) was observed on A533 Grade A and A508 Class 2 carbon steels (nominal pit depths were 30 and 6 mils, respectively). General surface corrosion and/or minor pitting type corrosion was observed for all other materials tested (Types 405/409 stainless steels and AISI 1010 carbon steel), except for Inconel 600 specimens which had no indications of tube surface corrosion. (ERA citation 06:034836)

DE82000453 PC **A03**/MF **A01**
Mid-American Solar Energy Complex, Minneapolis, MN.
Passive-Solar Retrofit Concepts.
Sep 81, 49p MASEC-PA-81-030, P-102-4
Contract AC02-79CS30150

Four retrofit passive solar designs for single-family dwellings are presented. The first design, for a house in Minnesota, involves insulating wall cavities and the attic with blown cellulose, reduction of infiltration, and installation of insulating shades on all windows. The second, for a house in Michigan, combines weatherization, a sunspace with clerestory, and a thermosiphoning collector. The third, for a house in Missouri, involves the addition of a large sunspace with a passive solar hot water preheater for a hot tub. The fourth, for a house in Indiana, combines intensive weatherization with a two-story sunspace and thermal chimney addition. All designs are thoroughly illustrated. (ERA citation 06:034605)

DE82000456 PC **A05**/MF **A01**
Mid-American Solar Energy Complex, Minneapolis, MN.
Passive-Solar Multi-Family Concepts.
Aug 81, 88p MASEC-PA-81-033, P-103-2
Contract AC02-79CS30150

Seven designs for passive solar apartment/townhouse buildings are presented. Each design is briefly described and thoroughly illustrated. The buildings are sited in Indiana, Michigan, Missouri, Ohio, South Dakota, and Minnesota. (ERA citation 06:034606)

DE82001158 PC **A04**/MF **A01**
Solar Energy Research Inst., Golden, CO.
Near-Term Improvements in Parabolic Troughs: An Economic and Performance Assessment.
R. Gee, and L. M. Murphy. Aug 81, 54p SERI/TR-632-870
Contract AC02-77CH00178

Improved parabolic-trough concentrating collectors will result from better design, improved fabrication techniques, and the development and utilization of improved materials. This analysis qualifies the performance potential of various parabolic-trough component improvements from a systems viewpoint and uses these performance data to determine the worth of each improvement on an economic basis. The improvements considered are evacuated receivers, silvered-glass reflectors, improved receiver, selective coatings, higher optical accuracy concentrations, and higher transmittance receiver glazings. Upper-bound costs for each improvement are provided as well as estimates of the increased solar system rates of return that are made possible by these improvements. The performance and economic potential of some of these improvements are shown to be substantial, especially

at higher collector operating temperatures. (ERA citation 06:034632)

ISM-227 PC **A02**/MF **A01**
Ames Lab., IA.
Passive Design Tutorial.
L. Hodges. 1979, 17p CONF-7906147-1
Contract W-7405-ENG-82
Annual Iowa solar operational results conference, Cedar Rapids, IA, USA, 21 Jun 1979.

The five types of passive solar heating systems are discussed: direct gain, thermal storage wall, sunspace (greenhouse), roof pond, and thermosyphon. Meteorological information and computational methods to enable a designer to estimate the thermal performance of a passive system in Iowa are given. (ERA citation 05:015382)

JHU/APL-QM-80-101 PC **A03**/MF **A01**
Johns Hopkins Univ., Laurel, MD. Applied Physics Lab.
Geothermal Energy Development in the Eastern United States. Technical Assistance Report No. 4. Geothermal Space Heating: Pittsville Middle/Elementary School, Pittsville, Maryland.
R. V. Briesen, and K. Yu. Jun 80, 33p
Contract AI01-76RA50090

A technical evaluation was made to determine whether geothermal energy obtained from a well could be used to space heat the new school building being constructed as well as the existing elementary wing of the Pittsville School. The first part deals with space heating the new school building only; the second part pertains to space heating the new school building together with the new existing wing. An addendum was added for new well and production pump costs. (ERA citation 05:032151)

LA-8283-PR PC **A05**/MF **A01**
Los Alamos Scientific Lab., NM.
Solar Energy Research at LASL. Progress Report, April 1-September 30, 1979.
S. R. Reisfeld, and D. A. Neeper. May 80, 77p
Contract W-7405-ENG-36

Solar energy research from April 1-September 30, 1979, performed by Los Alamos Scientific Laboratory's Group Q-11 in the areas of collector R and D and active and passive systems studies, is described. Accounts are also given of the Group's technical support to the Office of Solar Applications of the Department of Energy and of technology transfer to the scientific community, building industry, and the general public. The largest effort during this reporting period involved work on the Department of Energy (DOE) Passive Design Handbook. Other work in passive systems included a study of natural heat distribution mechanisms, further investigation of passive test rooms with special attention to the comparison between a room configured with a window-box collector and an adjoining direct-gain room, and computer calculations that develop a simplified method for predicting the behavior of an attached greenhouse. This method has been developed for direct-gain and storage-wall buildings. Research on solar collectors concerned testing the performance of both liquid and air heaters. The two-axis tracking collector test station is near completion and, with its high-temperature test loop, will permit testing of evacuated tube collectors from 200 to 500 exp 0 F. Data were collected on two of our active systems buildings, the National Security and Resources Study Center and the Nambe Community Building.Guidance was provided for DOE in funding actions for more than $500K in contract renewals and new projects as part of the technical support for collector R and D. The Q-11 Group Leader provided direct assistance at DOE Headquarters during a staff shortage from January-July. In addition to monitoring 75 collector research contracts, review meetings were established on both evacuated collectors and salt gradient solar ponds. (ERA citation 05:031998)

LBL-9576 PC **A04**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Energy Efficient Buildings Program. Chapter from Energy and Environment Division Annual Report 1978.
Aug 79, 68p EEB-79-5
Contract W-7405-ENG-48

Research in the Division's Energy Efficient Buildings Program addresses a broad range of technical and institutional issues that influence the pattern of energy use. These include both experimental and theoretical research into energy use in buildings, and the analysis of energy conservation strategies and measures. Topics discussed include: (1) building envelopes program; (2) ventilation program; (3) indoor air quality - gas stove emissions; (4) DOE-1 computer program for building energy analysis; (5) schools program; (6) hospitals program; (7) energy efficient windows program; (8) energy efficient lighting program; and (9) passive systems analysis and design. (ERA citation 05:001223)

LBL-9816 PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Evaluation of Residential Building Energy-Performance Standards.
M. D. Levine, D. B. Goldstein, M. Lokmanhekim, and A. H. Rosenfeld. Dec 79, 37p CONF-791233-2
Contract W-7405-ENG-48
Conference on thermal performance of the exterior envelopes of buildings, Orlando, FL, USA, 3 Dec 1979.

This paper reports on the development and analysis of energy-performance standards for residential buildings in the United States. The approach involves an assessment of the economic costs and benefits of alternative standards and provides quantitative estimates of the reduction of energy use resulting from the implementation of standards. The sensitivities of building energy use to design parameters of buildings - including size, orientation, aspect ratio, basement type, window area, and construction material - are assessed. The DOE-2 Building Energy Utilization Analysis program was used to evaluate the heating and cooling loads of residential buildings. Residential buildings were simulated in ten weather climates using hourly weather data with a variety of energy-conservation measures. (ERA citation 05:016004)

MSNW-78-3035(V.2) PC **A15**/MF **A01**
Mathematical Sciences Northwest, Inc., Bellevue, WA.
Analysis and Simulation of Performance Data for Residential Solar Heating and Heat Pump System in Seattle, Washington. Final Report, Volume II.
R. Taussig, J. Lockett, M. Storie, J. Isakson, and B. Levy. 15 Jun 78, 328p
Contract EG-77-C-02-4229

In order to investigate the effect of the regional differences in solar energy availability on residential solar heating systems, a study was conducted to analyze the performance of a solar heated house in the Pacific Cascades and to validate a solar heating and heat pump computer simulation program for this region. The house, called the Seattle City Light Project Weathervane house, uses solar energy from roof-top flat plate collectors to boost the performance of a water-to-air heat pump. If the temperature of the water storage tank drops too low, then auxiliary heating is provided by an off-peak immersion heater. Performance data for the ten month heating season was collected from Seattle City Light, and put into the form of a comprehensive baseline data document. The University of Wisconsin TRNSYS solar heating computer simulation program was used to model the performance of the house. The computer results were compared to the actual performance data in order to help validate TRNSYS with regional solar heating data. The computer results were also used to help in understanding the behavior of the Seattle City Light Project Weathervane house heating system. Actual solar heating system performance demonstrates that approximately 40% of the total house heating requirements were provided by the solar heating system. The Solar Baseline Data are presented here. (ERA citation 05:015385)

NP-1902593 PC **A03**/MF **A01**
Tata Energy Research Inst., Bombay (India).
Solid-Fuel Cooking Stoves: Bibliography.
May 81, 29p
U.S. Sales Only.

Forty-two citations with abstracts are presented which deal with stove designs that use coke, coal, firewood, biomass, etc. (ERA citation 06:022207)

NP-1902598 PC **A02**/MF **A01**
Energy Technology Support Unit, Harwell (England).
High Temperature Thermal Insulation Usage in UK Process Industries.
Nov 80, 8p
U.S. Sales Only.

Required properties and usage of high temperature thermal insulation in UK process industries are briefly described. The main features of high temperature thermal insulation usage are described for the following industries: iron and steel; non-ferrous metals; cement; glass; pottery; brick and refractories. The energy conservation potential, barriers to wider use of high temperature insulation, and opportunities for research are discussed briefly. (ERA citation 06:022245)

NP-1902600 PC **A04**/MF **A01**
National Research Council of Canada, Ottawa (Ontario).
Energy-Resource Requirements of a Solar-Heating System.
D. W. O. Rogers. Feb 79, 57p
U.S. Sales Only.

The methods of energy analysis have been applied to a liquid-based short-term storage solar space and water heating system suitable for a single family dwelling in Toronto. This system, which in many respects represents a worst case for solar heating, takes 1.0 to 3.5 years of operation to conserve the energy resources required to build, operate and maintain the system. Alternatively, over the twenty year lifetime of the system the energy resources used indirectly by the solar heating system amount to between 6 and 24% of the direct energy resources conserved by the system. These considerations do not significantly alter the energy conservation characteristics of the solar heating system unless thermally generated electricity is used as backup for a 50% solar heating system which replaces oil or gas heating - in this case only 4 to 9% of the energy resources are conserved by going solar. A factor of three variation in energy resource use in collector materials was found in a sample of 7 flat plate collectors with steel based collectors using the least. The total energy embodied in the collector was about double that found in the materials alone. The collectors and annual operating energy for the pumps were found to be the two most significant factors in the analysis. Appendices summarize the energy resource requirements embodied in the materials used for collectors and estimate the total energy resource requirements of conventional fuels delivered to the home. (ERA citation 06:021865)

ORNL/CON-43 PC **A16**/MF **A01**
Oak Ridge National Lab., TN.
Theory and Design of an Annual Cycle Energy System (ACES) For Residences.
E. A. Nephew, L. A. Abbatiello, and M. L. Ballou.
May 80, 357p
Contract W-7405-ENG-26

The basic concept of the Annual Cycle Energy System (ACES) - an integrated system for supplying space heating, hot water, and air conditioning to a building - and the theory underlying its design and operation are described. Practical procedures for designing an ACES for a single-family residence, together with recommended guidelines for the construction and installation of system components, are presented. Methods are discussed for estimating the life-cycle cost, component sizes, and annual energy consumption of the system for residential applications in different climatic regions of the US. (ERA citation 05:027322)

PAT-APPL-6-284 289 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office.
Radiative Cooler.
Patent Application,
S. W. Petrick, and R. D. Garcia. Filed 17 Jul 81, 13p
N82-10106/4, NASA-CASE-NPO-15465-1
Contract NAS7-100
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A device for use in passively cooling spaces, applicable to any level of thermal radiation in vacuum and to high-intensity thermal radiation in non-vacuum environments, is described. The device includes an enclosure nested in a multiplicity of thin, low-emittance, highly-reflective shields suspended in a casing in mutual angular relation and having V-shaped spaces for redirecting thermal radiation entering the sides of the shields. Successively reduced quantities of thermal radiation are reflected by the surfaces along substantially parallel paths extended through the V-shaped spaces to a common heat sink such as the cold thermal background of space.

PB82-130139 PC **A05**/MF **A01**
Mueller Associates, Inc., Baltimore, MD.
Multi-Family Solar Domestic Hot Water Analysis,
David R. Wedekind. May 81, 100p MAI-199, NBS/GCR-81-322
Contract NBS-78-3534
Portions of this document are not fully legible.

The National Bureau of Standards is presently reviewing the Definitive Performance Criteria for Residential Solar Heating, Cooling and Hot Water Systems. In support of that effort, this report describes a study designed to quantify the effect of daily domestic hot water loads and system design on the performance of multi-family solar domestic hot water systems. Two multi-family solar domestic hot water systems judged representative of the systems funded by the HUD Residential Solar Demonstration Program, along with possible modifications to these systems, are modeled using the TRNSYS simulation computer program. The effects of collector array efficiency, storage capacity, and distribution heat losses were studied over a range of daily domestic hot water loads from 11 to 190 L/day-unit.

PB82-132614 PC **A07**/MF **A01**
C-E Marine Power Systems, Windsor, CT.
Improved Atomization of Residual Fuels for Marine Boilers. Volume II: Cold Flow Baseline Performance Testing and Variation of Key Parameters - Cold Flow Improvement of Marine Boiler Atomizers,
Donald A. Smith, and Richard C. LaFlesh. Aug 81, 127p MA-RD-920-78074
Contract MA-RD-7-38010
See also Volume 1, PB-289 195.

This report is a summary of work performed by C-E under Task 2 & 3 of the Maritime Administration sponsored R&PD project entitled Marine Boiler Atomizer Optimization Through Improved Atomizer Performance Measurement Techniques. The objectives of Tasks 2 & 3 include use of the improved atomizer performance measurement techniques developed under Task 1 to define the performance of a typical commercially sized marine 'Y' jet atomizer operating at design conditions in a cold flow (non-combusting) spray chamber using a suitable test fluid. The effects of fuel temperature, viscosity, supply pressure, atomizing media temperature, pressure, and relative flow was also defined. A sensitivity study was also completed to define the optimum geometry for an 'X' jet atomizer and a methodology has been developed for sizing a range of commercially sized atomizers. Droplet ballistics information is also presented describing droplet velocities and trajectories for a typical marine atomizer.

PB82-133703 PC **A05**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Solar Industrial Process Heat Systems - An Assessment of Standards for Materials and Components,
Walter J. Rossiter, and Walter E. Shipp. Sep 81, 98p NBSIR-81-2381
Sponsored in part by Department of Energy, Washington, DC. Assistant Secretary for Conservation and Renewable Energy.

A study was conducted to obtain information on the performance of materials and components in operational solar industrial process heat (IPH) systems, and to provide recommendations for the development of standards including evaluative test procedures for materials and components. An assessment of the needs for standards for evaluating the long-term performance of materials and components of IPH systems was made. The assessment was based on the availability of existing standards, and information obtained from a field survey of operational systems, the literature, and discussions with individuals in the industry. Field inspections of 10 operational IPH systems were performed. The study did not address the thermal efficiencies and health and safety considerations of IPH systems.

PB82-133810 PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Engineering - Economic Analysis of Improved Heat Pump Performance for Minimum Standards Development.
Final rept.,
Stephen R. Petersen, Kimberly A. Barnes, and George E. Kelly. Jul 81, 68p NBSIR-81-2241
Sponsored in part by Department of Energy, Washington, DC.

This report provides a methodology and seasonal performance data that could be used in the development of a reference basis for minimum efficiency standards for heat pumps that are economically justified on a life-cycle basis. Criteria for economic optimization are outlined. The methodology used to compute seasonal heating and cooling performance ratings and the annual energy savings resulting from efficiency improvements, by climate region, is detailed. The interdependence between efficiency ratings in the heating and cooling modes is explored using statistical analysis. An example of the procedure for determining maximum cost effective efficiency levels is demonstrated for a 36,000 Btu/h heat pump.

PB82-137035 PC **A04**/MF **A01**
Swedish Council for Building Research, Stockholm.
Right Combination of Measures in the Right Building at the Right Time: Energy Conservation in the Form of Combinations of Measures.
1981, 55p D10:1981, ISBN-91-540-3553-8

The basic premise of the method described is that energy conservation is most successful if it is carried out in the form of correctly designed combinations of measures applied at the right time. This report mainly deals with the way in which combinations of measures are made up from the technical point of view, and the way their scope is determined by economic criteria.

PB82-137191 PC **E10**/MF **E10**
Commission of the European Communities, Luxembourg.
Development of a Directly-Fired Heat Pump for Domestic and Light Commercial Application.
Final rept.,
D. T. G. Strong. 1981, 270p EUR-7063-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The development of a gas-fired heat pump based on the Rankine principle and using miniature turbomachinery is described. The need for a high-molecular weight working fluid is explained and tests carried out on candidate fluids are described. A computer program has been written to measure the effect of interactions between individual parameters and component efficiencies. A test-rig has been successfully operated over a three-year period and an economic analysis shows that the application of this gas-fired heat pump to a domestic situation could result in substantial savings in fuel costs.

PB82-139031 PC **E05**/MF **E05**
Commission of the European Communities, Luxembourg.
Description and Performance of an Active Solar Cooling System, Using a LiBr-H2O Absorption Machine,
D. Van Hatterm, and P. Actis Dato. c1981, 106p EUR-6864-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The report describes the design, modelling and performance of an active solar cooling system in Northern Italy. Various aspects related with active solar cooling, like energy storage, room comfort, modelling and the LiBr - H2O absorption cycle are discussed.

PB82-140146 PC **E07**/MF **E07**
Commission of the European Communities, Luxembourg.
Heat Recovery Installations with Reflux Heat Pipes as Basic Components (Waermerueckgewinnungsanlagen mit Reflux-Waermerohren als Bauelemente).
Final rept.,
M. Groll, H. Nguyen-Chi, and H. Kraehling. c1981, 151p EUR-7006-DE
Text in German.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The aim of the research is to investigate gravity-assisted heat pipes and two-phase thermosyphons ('reflux heat pipes') as highly efficient thermal components for heat recovery units. On the one hand, the heat transfer and fluid-mechanic phenomena in these components are investigated. On the other hand, the long-term materials compatibility of the components and their operational behavior are tested.

PB82-141060 PC **A03**/MF **A01**
American Gas Association Labs., Cleveland, OH.
Commercial Cooking Equipment Improvement. Volume I: Range Ovens.
Final rept. Jan 79-Dec 80,
R. L. Himmel, and R. E. Stack. Oct 81, 33p GRI-80/0079.1
Contract GRI-5080-345-0255
See also Volume 2, PB82-141086.

This report describes the efforts of a project aimed at improving the operating efficiency of gas-fired commercial cooking equipment, specifically, hotel and restaurant heavy duty range ovens. A conventional heavy duty range oven was modified to operate utilizing the principles of forced convective heat transfer not usually applied to range ovens. Efficiency improvements of 45 and 55 percent over conventional units have been demonstrated as well as reducing cooking time for light cake loads by 45 and 50 percent. Part of these improvements is due to the application of not only the forced convection principles, but also an infrared burner. Flue losses from the range ovens have also been reduced from about 80 percent to 53 and 29 percent depending upon the design.

PB82-141102 PC **A07**/MF **A01**
Solar Turbines, Inc., San Diego, CA.
High Temperature Metallic Recuperator.
Annual rept. May 80-Apr 81,
Michael E. Ward, Neil G. Solomon, and Charles E. Smeltzer. Jun 81, 130p SR81-R-4861-15, GRI-80/0074
Contract GRI-5080-342-0303

An industrial 4.5 MM Btu/hr axial counterflow recuperator has been designed and fabricated to deliver 1600F combustion air. This prototype recuperator has been designed to handle rapid cyclic loading, a long life, acceptable costs, and a low maintenance requirement. Two high temperature pre-heat burners have been purchased in order to measure their capabilities. These components were supplied by industrial burner manufacturers. A cost benefit analysis of a high temperature waste heat recovery system utilizing the recuperator developed by this project and components capable of 1600F combustion air preheat has shown that this system would have a payback period of less than two years. As part of the application and process survey, fifteen companies and industrial associations were interviewed. In general, there was great interest in recuperation in large energy consuming industries. Determination of long term environmental effects on candidate recuperator tubing alloys has been completed. Alloys found to be acceptable in the 2200F flue gas environment of a steel billet reheat furnace, were identified. This project year was the second year of effort in a three year plan to advance metallic recuperators for delivery of high quality air with the highest practical effectiveness.

PB82-144676 MF **A01**
Franklin Research Center, Philadelphia, PA.
Installation Guidelines for Solar Domestic Hot Water (DHW) Systems in One- and Two-Family Dwellings. Second Edition.
1980, 112p HUD-0002079, HUD/PDR-407(2)
Contract HUD-H-2377
Sponsored in part by the Department of Energy, Washington, DC.
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 023-000-00520-4.

Written for the professional installation contractor and the skilled homeowner, this manual presents instructions for solar domestic hot water systems installation in single - family and two - family dwellings. Using these guidelines together with the manufacturer's manual, individuals should be able to install and fill their systems. The manual assumes knowledge of the basic skills of plumbing, wiring, roofing, carpentry, and masonry, as well as knowledge of paints, glazing, and insulation materials. It begins with discussions of startup, system layout, and siting and continues with procedures for roof mounting and ground mounting and for transfer fluids, piping, and ductwork. Additional chapters discuss insulation; pumps, valves, gages, and expansion tanks; heat exchangers and storage tanks; and system controls. Further chapters discuss checkout and chargeup of the system and mainte-

nance. A checklist to be consulted when doing the actual installation concludes the manual. Extensive photographs and diagrams are provided, and appendices present a glossary, about 30 references, a suggested list of tools, and HUD's minimum property standards which apply to dwellings equiped with solar heating and solar domestic hot water systems.

PB82-144684 MF **A01**
AIA Research Corp., Washington, DC.
Survey of Passive Solar Buildings.
1979, 180p HUD-0002080, HUD/PDR-287(2)
Contract HUD-H-2384
Sponsored in part by the Department of Energy, Washington, DC.
Paper copy available from Supt. of Docs., Washington, DC 20402, order number 023-000-00437-2.

This publication describes passive solar buildings that have been constructed in the United States to date. The report's purpose is to offer a working definition and a basic understanding of a number of existing applications of passive solar designs. A passive solar heating and cooling system is defined as one in which thermal energy flows through a building by natural means. Its operation involves the control of the thermal energy flow and includes the ability to completely stop energy flow from entering or leaving the building. Sophisticated design is required to achieve operational efficiency. Three basic passive solar concepts are identified, each involving different relationships between the sun, the storage mass, and the living space. These concepts are direct gain (from sun to living space to storage mass); indirect gain (from sun to storage mass to living space); and isolated gain (from sun to collector space to storage mass to living space). Examples of indirect gain solar building are grouped into mass trombe, water trombe, and roof pond approaches. Variations of the isolated gain concept are illustrated by the thermosiphon building type and the sunspace building type as well as by several wall and window component systems. The buildings representing each type of passive energy application are listed and described with accompanying photographs and architectural plans. Passive solar cooling methods are briefly delineated and include night sky radiation, evaporative cooling, dessicant cooling, underground building, and induced ventilation. A reference list is provided.

PB82-802513 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Energy Conservation: Buildings. 1977-October, 1981 (Citations from the NTIS Data Base).
Rept. for 1977-Oct 81.
Dec 81, 377p
Supersedes PB80-812423, and NTIS/PS-79/0556. See also 1964-76, NTIS/PS-79/0502.

Energy conservation in residential, commercial, and industrial buildings through use of efficient heating, air conditioning, and lighting systems is discussed. Topic areas cover the retrofitting of existing buildings, efficient use of electric power, and economics of energy conservation options. A few abstracts deal with general studies on the potential for conserving energy in buildings and guidelines for building owners. Subject areas excluded from this bibliography but available as separate Published Searches are energy conservation through building design, waste heat utilization, total energy systems, and heat pumps. (This updated bibliography contains 369 citations, 64 of which are new entries to the previous edition.)

PB82-857186 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Heat Exchangers Used by the Food Industry. 1972-1981 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for Jan 72-Dec 81.
Dec 81, 142p
Prepared in cooperation with the International Food Information Service, Frankfurt (Germany, F.R.).

This bibliography contains citations concerning heat exchangers used by the food industry. The design and operations of numerous heat exchangers are discussed, and the economics including energy conservation are considered. Included in the discussion are plate, spiral, and tubular heat exchangers. (Contains 164 citations fully indexed and including a title list.)

PB82-858978 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Air Filtration and Purification. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 129p
Supersedes PB81-853566. Prepared in cooperation with the Department of Energy, Washington, DC.

The storage of toxic solvents and the control of dust by means of ventilation and filtration systems are discussed. Emphasis is placed on dust control in mining operations and the prevention of dust explosions. Sampling techniques for accurate measurement of suspended particulates are also included. (This updated bibliography contains 116 citations, 35 of which are new entries to the previous edition.)

13B. Civil Engineering

AD-A106 832/9 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Analysis of HUD's May 4, 1981 Response Concerning Its Efforts to Alleviate Housing Abandonment.
25 Jun 81, 8p Rept no. GAO/CED-81-130

The HUD response focused on the following four subject areas: (1) Strategies for alleviating housing abandonment. (2) Laws and regulations which impede solutions to the abandonment problem. (3) Impact of HUD programs on housing abandonment. (4) 'Squatters' in HUD-owned houses.

AD-A106 834/5 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Federal Land Acquisition and Management Practices.
11 Sep 81, 91p Rept no. GAO/CED-81-135
Report to Senator Ted Stevens.

The National Park Service, Department of the Interior, followed a general practice of acquiring outright ownership of all lands in the National Park System. However, in April 1979, the Service revised its land acquisition policy to give greater consideration to protecting areas through the use of easements, zoning, and cooperative agreements with State and local governments. Although some progress has been made in using alternatives, the Park Service continues to purchase almost all land outright.

AD-A106 838/6 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Eliminating Contractor Inspections of Federal Water Projects Could Save Millions.
29 Sep 81, 36p Rept no. GAO/CED-81-146

This report discusses three approaches to inspecting the construction of dams and other Federal water resources projects--contractor self-inspection with agency monitoring, used by the Corps of Engineers; agency inspection, used by the Bureau of Reclamation; and third-party inspection, occasionally used by both agencies. (Author)

AD-A106 862/6 MF **A01**
PRC Consoer Townsend, Inc., St. Louis, MO.
National Dam Safety Program. Busch Wildlife Area Lake Number 35 Dam (MO 10092), Mississippi - Kaskaskia - St. Louis Basin, St. Charles County, Missouri. Phase I Inspection Report.
Final rept.,
Walter G. Shifrin. Nov 79, 153p
Contract DACW43-79-C-0075
Prepared in cooperation with Engineering Consultants, Inc., Englewood, CO.
Availability: Microfiche copies only.

This dam has been classified as unsafe, non-emergency by the St. Louis District as a result of the application of the following criteria: (1) Spillway will not pass 50 percent of the Probable Maximum, Flood; (2) Overtopping could result in dam failure; and (3) Dam failure significantly increases the hazard to loss of life downstream.

AD-A106 863/4 MF **A01**
PRC Consoer Townsend, Inc., St. Louis, MO.
National Dam Safety Program. A. C. Schneider Lake Dam (MO 31563), Missouri - Kansas City River Basin, Gasconade County, Missouri. Phase I Inspection Report.
Final rept.,
Walter G. Shifrin. Sep 80, 149p
Contract DACW43-80-C-0094
Prepared in cooperation with PRC Engineering Consultants, Inc., Englewood, CO.
Availability: Microfiche copies only.

This dam appears to be in satisfactory condition. However, the dam does not have adequate spillway capacity. Considering the number of inhabited dwellings, a state highway and an oil depot being located downstream of the dam, the PMF is considered the appropriate spillway design flow for A. C. Schneider Lake Dam. The inspection and evaluation indicates that the reservoir/spillway system can accommodate approximately 5 percent of the Probable Maximum Flood without overtopping the dam. It also indicates that the reservoir/spillway system can not accommodate the one-percent chance flood without overtopping, however, the reservoir/spillway system of A. C. Schneider Lake Dam can accommodate the ten-percent chance flood without overtopping. Other deficiencies noted by the inspection team were: the erosion gully along the downstream left abutment/embankment contact, the trees on the downstream and upstream slope of the dam, wave erosion on the upstream slope, the unsupported length of the principal spillway pipe at the outlet, the eroded gulley in the emergency spillway channel, some vegetative growth around the principal spillway inlet, a need for periodic inspection by a qualified engineer and a lack of maintenance schedule. The lack of seepage and stability analyses on record is also a deficiency that should be corrected.

AD-A106 864/2 MF **A01**
CH2M Hill, Gainesville, FL.
Installation Restoration Program Records Search for Langley Air Force Base, Virginia.
Jun 81, 285p
Contract F08637-80-G-0010
Availability: Microfiche copies only.

The Langley AFB Records Search did not reveal any specific documentation of past hazardous waste disposal at the installation or migration of contaminants off the installation. However, the potential does exist for contaminant migration due to the following factors: (1) The age of the installation and the large number of past disposal sites (11) at the installation; (2) The lack of adequate records concerning the types of materials disposed of at the installation; (3) The high groundwater table conditions at the installation; and (4) The environmentally sensitive location of the installation with respect to Back River, an active shellfish harvesting area. Some limited follow-on field survey work is warranted to ensure that contaminant migration is not a problem at Langley AFB. No indication was found from the records or from the interviews of potential contaminant migration from Cape Charles Air Force Station or Bethel Manor off-base housing.

AD-A106 932/7 PC **A11**/MF **A01**
Corps of Engineers, Detroit, MI. Detroit District.
Mitigation of Shore Damage Attributed to the Federal Navigation Structures at Ludington Harbor, Michigan.
Final environmental statement.
Dec 75, 235p

The Corps of Engineers proposes to mitigate shore erosion in the vicinity of Ludington Harbor, Mason County, Michigan, that is attributable to the Federal navigation structures at the harbor. Studies have determined that the erosion problem is partly attributable to the navigation structures as well as other natural erosion processes. The plan considered most practical for this purpose entails the establishment and maintenance of two beach nourishment supply sites (one north and one south of the harbor structures) to provide immediate and continued relief to damaged shore areas. The unpolluted sediment accululation at or near the harbor mouth will serve as the source of material for the nourishment supply. The establishment and periodic sustenance of these areas will enable those quantities of littoral materials presently interrupted and diverted lakeward by the navigation structures to be restored to the shoredrift system.

AD-A106 933/5 PC **A09**/MF **A01**
Corps of Engineers, Detroit, MI. Detroit District.
Mitigation of Shore Damage Attributed to the Federal Navigation Structures at Port Sanilac Harbor, Michigan.
Final environmental statement.
Sep 75, 176p

The Corps of Engineers proposes to mitigate shore erosion in the vicinity of Port Sanilac Harbor, Sanilac County, Michigan, that is attributable to the Federal navigation structures at the harbor. Studies have determined that erosion attributable to the navigation project is approximately 43.0% of the total erosion due to all causes. The plan considered most practical for this purpose entails creation of a feeder beach and a subsequent periodic nourishment of the area suffering shore damage. Approximately 90,000 cubic yards of fill material will be required initially and 30,000 cubic yards of fill will be required periodically (approximately annually) for an undetermined number of years. The establishment and sustenance of such a beach will provide the quantities of littoral material interrupted by the navigation project to the shore downdrift. (Author)

AD-A106 934/3 PC **A09**/MF **A01**
Corps of Engineers, Detroit, MI. Detroit District.
Maintenance Dredging & Confined Disposal Facility for the Crooked River Portion of Michigan's Inland Route and the Operation, Maintenance, & Proposed Public Use Facilities for the Alanson Lock and Weir, Michigan.
Final environmental statement.
Jan 80, 180p

This statement addresses the Operation and Maintenance of the Crooked River portion of the Inland Route, Michigan, including dredging, dredge material disposal, and the continued operation and maintenance of the Crooker River lock and weir at Alanson, Michigan. Since an upland disposal site would be used, a transfer facility would also be required. Dredged material removed from the Crooked River would be transferred to trucks at the foot of Snider Road at the Crooked River, and hauled to the disposal site, located approximately one (1) mile north on Snider Road. The estimated annual shoaling rate in Crooked River is 1,000 cubic yards, and the river will require about 9,500 cubic yards of backlog dredging. Thus, the total capacity of the site for 10 years is 19,500 cubic yards. Maintenance dredging is necessary to restore the waterway's ability to accommodate recreational craft navigation. The proposed Federal action also includes operation and structural maintenance of the lock and weir on the Crooked River at Alanson. Structural maintenance and operations are required to insure continuance of vessel passage along the Inland Route. Water level regulation of the upstream rivers and lakes is a function of the lock facilities. Additionally included in the action is the proposed construction of public use facilities at the lock. The plan provides for the construction of a parking lot, restroom facilities, storage building, observation platform and docking area, and landscaping. (Author)

AD-A106 935/0 PC **A07**/MF **A01**
Corps of Engineers, Detroit, MI. Detroit District.
Maintenance Dredging of the Federal Navigation Channels in the St. Clair River, Michigan.
Final environmental statement.
Jan 76, 126p

The proposed action is to perform maintenance dredging of the St. Clair River when required to remove shoaling. Average annual volume removed is approximately 130,000 cubic yards consisting primarily of gravel, sand, and silt. The material removed will be disposed of deep water or placed on selected onshore sites. All materials scheduled for removal from the St. Clair River have been classified by the U.S. Environmental Protection Agency as suitable for unrestricted open water disposal. Most maintenance operations are accomplished by hopper dredge, but a derrickboat utilizing a bucket dredge removes channel obstructions if rock rather than sand or silt must be removed. The open water disposal sites used by the hopper dredge are located in the deep water of Lake Huron several miles north of the Blue Water Bridge and during 1976 in deep water of the North Channel adjacent to Point Au Chenes. The use of the North Channel disposal area will be discontinued after the 1976 work season. In subsequent years sediments removed from the lower reaches of the river will be stockpiled at an onshore site furnished by the Michigan Department of Natural Resources for future project was uses in maintenance and further development of the St. Clair Flats Wildlife Area. (Author)

AD-A106 936/8 PC **A09**/MF **A01**
Corps of Engineers, Detroit, MI. Detroit District.
Maintenance Dredging of the Federal Navigation Channels in the Saginaw River and Saginaw Bay, Michigan.
Final environmental statement.
Dec 75, 183p

The proposed project is to perform maintenance dredging of the Saginaw River and Saginaw Bay Federal Navigation channels. Dredging will be performed by a Government-owned hopper dredge. Approximately 140,000 cubic yards of polluted material dredged from the river, from the Detroit and Mackinac Railroad Bridge to the upper limits of the harbor, is placed on the confined disposal area on Middle Ground Island. The polluted channel section from the D&M R.R. bridge to the river mouth and the section throughout the inner bay will not be dredged until a confined disposal site is constructed to contain this dredged material. The average annual volume of shoaling throughout the project is approximately 840,000 cubic yards. (Author)

AD-A106 971/5 PC **A08**/MF **A01**
Corps of Engineers, Detroit, MI. Detroit District.
Final Environmental Statement. Sebewaing River, Michigan. Operation and Maintenance, Confined Disposal Facility, and Flood Control Facilities.
Apr 78, 172p

The proposed Federal action includes maintenance dredging of the Sebewaing River navigation and flood control channel, construction of a confined disposal facility for contaminated dredge material, repair of stop-logs and other structures forming the flood protection project, maintenance of navigation structures protecting the channel, and, as necessary, dynamiting the ice jams to prevent flooding of the Village of Sebewaing. Dredging and disposal activities will have temporary adverse effects on water quality, organisms living in and on the bottom sediments in affected areas, aesthetics, recreational fishing, and the ability of the area to support aquatic life. Beneficial impacts of maintenance dredging include continuance of the existing flood carrying capacity of the river and continuance of the existing local economy through preservation of navigation dependent commercial enterprises. Maintenance of existing flood control facilities may have temporary adverse effects on water clarity, vegetation on levees, and small animals residing in and on the facilities. Beneficial effects include keeping the structures in aesthetically pleasing, functioning condition, thereby reducing the threat of flooding in the Village of Sebewaing.

AD-A106 974/9 PC **A04**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Hydraulics Lab.
Investigation of Release Temperatures for Kinzua Dam, Allegheny River, Pennsylvania. Hybrid Model Investigation.
Final rept.,
Mark S. Dortch. Sep 81, 71p Rept no. WES/TR/HL-81-9

Kinzua Dam, which impounds the Allegheny Reservoir, is a multipurpose project that includes pumped-storage hydropower and flood control. Prior to construction of Kinzua Dam, the Allegheny River in its vicinity was considered primarily a warmwater stream and supported an important smallmouth bass sport fishery. Since construction of the dam and power station, stream temperatures below the dam have been colder than expected. A hybrid modeling study was initiated to determine the causes of colder-than-expected releases and to identify and evaluate measures that could be taken to increase the release temperatures. Temperature data were collected and the enlarged data base was used to better understand the physical processes to be simulated in a pumped-storage reservoir thermal simulation numerical model. A physical model, scale 1:100, of the inlet-outlet structure and the surrounding Allegheny Reservoir near-field topography was used to determine the selective withdrawal and pumped-storage mixing characteristics. Mathematical thermal model simulations were used to determine the major factors contributing to the release characteristics. The study determined that the pumped-storage operations have not been the cause of the colder-than-desired releases. Pumped-storage actually causes the hypolimnion to warm faster without significant cooling of the epilimnion. Structural modification of the sluices was determined to be the most effective and practical means of releasing warmer water.

AD-A106 976/4 PC **A02**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
A Statistical Evaluation of Soil and Climatic Parameters Affecting the Change in Pavement Deflection during Thawing of Subgrades,
Edwin J. Chamberlain. Jul 81, 18p Rept no. CRREL-81-15

This report analyzes the results of a field study previously reported by Scrivner et al. (1969) for the National Cooperative Highway Research Program. These authors studied the seasonal pavement deflection characteristics of 24 test sites on roads in service in regions with freezing indexes ranging from 100 F-days to 2100 F-days. They used the Dynaflect cyclic pavement loading device to determine the pavement system response. Of specific interest to my analysis was the increased pavement deflection after freezing and thawing and the time to recovery of normal deflection characteristics. These characteristics were related to soil and climatic factors using statistical techniques. The most significant observations of this statistical analysis are: (1) that the freezing index is not a significant parameter in determining the percent increase in pavement deflection during thawing, and (2) that the recovery time is inversely proportional to the depth of freezing. As was expected, the most significant variable affecting the increase in pavement deflection was the frost susceptibility classification. This observation reinforces the necessity for careful selection of soil materials used in pavement systems. (Author)

AD-A106 979/8 PC **A10**/MF **A01**
Corps of Engineers, Detroit, MI. Detroit District.
Final Environmental Impact Statement on Modifications to Monroe Harbor, Michigan.
Feb 80, 209p

The proposed plan for harbor modification consists of deepening (27-28 feet below Low Water Datum) and widening (500 feet) of the lake channel and lower river channel of the existing project. It also provides for lengthening the existing channel and for the construction of a turning basin in Lake Erie. The dredged material which is unsuitable for open water disposal would be confined in a crescent shaped disposal facility of approximately 190 acres. A wetland would be created behind the disposal facility by raising the lake bottom with clean fill to approximately Low Water Datum. The deep draft channel would allow larger, more economical vessels into the harbor. The confined disposal facility would protect shore areas from wind and wave attack. The rock-faced disposal facility would create a beneficial habitat for aquatic life. The wetland constructed behind the disposal facility would create feeding and spawning areas for fish, provide nesting, feeding and cover for waterfowl, and provide recreational opportunities for fishermen, hunters and sightseers.

AD-A107 087/9 PC **A05**/MF **A01**
Army Engineer District, Philadelphia, PA.
Trexler Lake Project, Lehigh River Basin, PA. Supplement.
Final environmental impact statement.
1975, 90p
Supplements report dated 24 Aug 73.

Since the completion of the final EIS, concern was expressed over the Trexler Lake operating program, its low flow releases and their significance to the downstream reaches of Jordan Creek and the ground water table. The intent of this supplement was to add to the final data, indicate flow investigations and re-affirm that the lake will be operated in a manner that will not aggravate existing conditions. (Author)

AD-A107 090/3 PC **A05**/MF **A01**
Corps of Engineers, St. Paul, MN. St. Paul District.
Ontonagon Harbor Operation and Maintenance Activities. Lake Superior.
Final environmental statement.
Aug 75, 89p

The action involves operation and maintenance of Ontonagon Harbor, Michigan. Principal activities include breakwater repair, dredging, and dredge material disposal. The operation and maintenance of Ontonagon Harbor provides for safe use of the harbor by recre-

ational craft. The use of polluted dredge material in the construction of a waste treatment facility and as fill on biologically sterile lands adjacent to the lagoons, provides advantageous use for the dredge material. The use of non-polluted dredge material as beach nourishment retards the erosion of the shoreline in the area. Adverse effects of the Corps of Engineers operation and maintenance activities in Ontonagon Harbor include increased turbidity and associated biological effects due to dredging, increased noise and congestion in the harbor, and land use alterations due to on-land placement of dredge material.

AD-A107 091/1 PC **A13**/MF **A01**
Corps of Engineers, Detroit, MI. Detroit District.
Recreational Boat Harbor, Cedar River, Michigan. Revisions to General Design Memorandum Number 1 and Environmental Impact Statement. Supplement Number 1.
Final rept.
Aug 80, 279p

A small boat harbor located at the mouth of the Cedar River in the western upper peninsula of Michigan has long been the goal of the Michigan Department of Natural Resources and local entities. Because of the distances between the two existing adjacent harbors of Escanaba, Michigan and Menominee, Michigan, a local harbor of refuge (small boat harbor) would be convenient to area boaters. The present plan of improvement requires construction of an eastern pier, 875 feet in length of rubblemound construction, and rehabilitating the existing western pier with rubblemound construction (navigation lights would be installed on each pier). The construction would allow a recreational small boat harbor to be built by the Michigan Department of Natural Resources upstream of the described construction.

AD-A107 092/9 PC **A08**/MF **A01**
Corps of Engineers, Detroit, MI. Detroit District.
Confined Disposal Facility and Maintenance Dredging of the Les Cheneaux Island Federal Navigation Channels, Michigan.
Final environmental statement.
Jan 79, 173p

The proposed action is the construction of a confined disposal facility for contaminated dredged materials and maintenance dredging of the Les Cheneaux Island channels. The dredged materials disposal facility would be located inland, approximately two miles by road from the new Village of Cedarville Marina. The facility would have a capacity of 110,000 cubic yards. This would contain a ten year maintenance quantity of 40,000 cubic yards, plus 70,000 cubic yards of backlog. In addition, maintenance dredging would include another 18,000 cubic yards of bottom material suitable for open lake disposal. A total of 128,000 cubic yards would be dredged. The channels to be maintained are approximately 40,000 feet in length and have previously been deepened to 7 feet and widened to 100 feet with additional enlargement where required. Maintenance dredging is necessary for continued recreational use of the channels.

AD-A107 148/9 PC **A09**/MF **A01**
Corps of Engineers, Waltham, MA. New England Div.
Big River Reservoir Project. Pawcatuck River and Narragansett Bay Drainage Basins. Water and Related Land Resources Study. Volume I. Main Report.
Jul 81, 181p
See also Volume 3, AD-A105 822. Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The purpose of this study was to evaluate all feasible alternative plans for providing adequate water supplies, protecting flood-prone areas, preventing flood damages and meeting the recreational needs of the Pawcatuck river and Narragansett Bay Drainage Basin area. Three detailed plans were formulated, assessed and compared using economic, engineering, social and environmental criteria. (Author)

AD-A107 239/6 PC **A05**/MF **A01**
Dames and Moore, Cranford, NJ.
Noise Control: Pile Driver Demonstration Project, Waterloo, Iowa.
Final rept.,
Fred M. Kessler, and Paul D. Schomer. Jul 81, 94p
CERL-TR-N-111
Contracts CERL-08684-004-10, EPA-78-D-H0234

A project jointly sponsored by the Environmental Protection Agency (EPA), Office of Noise Abatement and Control; the U.S. Army Corps of Engineers, Construction Engineering Research Laboratory (CERL); and the Directorate of Civil Works was undertaken to demonstrate in a construction project the availability of retrofit control technology for pile drivers. Various in-use retrofit noise control measures for reducing the noise of pile drivers were investigated: alternative pile driving techniques, mufflers, noise enclosures, impact cushions, and vibration damping of piles. Costs and productivity impacts associated with the noise control measures were also examined. Costs were developed in units of dollars per pile. Productivity was identified in terms of the time to set up and drive a pile. The ability of a general construction contractor to bid on a noise specification, and then obtain and implement the noise control measures during the construction project were a part of the demonstration. The vibratory pile driver took the longest time to drive a pile. The noise enclosure and muffler had no significant impact on the time to drive a pile. The enclosure did require a longer set up time, but a longer duration test is required to substantiate these productivity data. The Corps of Engineers' use of a detailed contract bid document specifying noise control requirements was successful.

AD-A107 240/4 PC **A02**/MF **A01**
Coastal Engineering Research Center, Fort Belvoir, VA.
Some Observations on the Economics of 'Overdesigning' Rubble-Mound Structures with Concrete Armor.
Coastal engineering technical aid rept.,
J. Richard Weggel. Jun 81, 14p Rept no. CERC-CETA-81-7

A cost comparison is made between two designs for a revetment-breakwater using concrete armor units. Both designs used the same type of unit (dolosse); however, two different stability coefficients were used in the designs. The comparisons shows that significant decreases in armor unit size may result in only insignificant cost savings and even cost increases for some conditions. This occurs because more smaller units are required to armor a given structure surface area, and any savings in material costs is offset by the increased cost of forming, stripping, and placing a greater number of smaller units. (Author)

AD-A107 293/3 PC **A04**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
Surface Drainage Design for Airfields and Heliports in Arctic and Subarctic Regions.
Special rept.,
Edward F. Lobacz, and Kenneth S. Eff. Sep 81, 61p Rept no. CRREL-SR-81-22

This report presents engineering guidance and design criteria for drainage facilities at Army and Air Force airfields and heliports in arctic and subarctic regions. Attention is given to hydrologic criteria, icings, environmental impact, storm drains and design computer programs. A design example and a list of 40 references are included in two appendixes. (Author)

AD-A107 294/1 PC **A03**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
Pothole Primer. A Public Administrator's Guide to Understanding and Managing the Pothole Problem.
Special rept.,
Robert A. Eaton. Sep 81, 30p Rept no. CRREL-SR-81-21

Potholes have become a problem of national proportions. We have seen Congress, in 1978, consider a special $250-million 'pothole bill,' and in 1979 a special Federal-level Task Force was established to study the pothole. This booklet has been prepared for the specific purpose of assisting elected officials and non-engineering administrators of cities, towns, and military facilities in New England in understanding and managing their pothole problems in asphalt pavements. We have attempted to keep this booklet as non-technical as possible so that non-engineers can use it. (Author)

AD-A107 320/4 PC **A02**/MF **A01**
Federal Aviation Administration, Washington, DC. Office of Environment and Energy.
SIMPLEX 'A' - A Simplified Atmospheric Dispersion Model for Airport Use (Users Guide).
Users manual,
Howard M. Segal. Jul 81, 25p Rept no. FAA/EE-81-8

The method, limitations and uses of the SIMPLEX 'A' atmospheric dispersion model are described. The model determines pollutant concentrations from taking-off aircraft and has the flexibility to easily accept parameter changes. It can treat either single or multiple aircraft departures and permits air quality calculations to be made by persons without an extensive computer background. The program is listed and the results of two sample problems are given to illustrate the use of the model. This is a research model with many of its dispersion and turbulence parameters still under investigation. As such it has not been adopted by the FAA for formalized pollution assessments. (Author)

AD-A107 337/8 PC **A04**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Structures Lab.
Structural Stability Evaluation, Winnibigoshish Dam.
Final rept.,
Carl E. Pace. Sep 81, 73p Rept no. WES/MP/SL-81-27
Contract NCS-1A-78-75

A typical interior monolith of Winnibigoshish Dam was evaluated for adequacy in stability for five load cases: Normal operation; Normal operation with truck loading (H15-44); Normal operation with earthquake; Normal operation with ice; and High-water condition. By using the conventional stability analysis (rigid body assumptions), the approximate magnitude of loads which are on the foundation piles were determined; but, without knowing the supporting characteristics of the foundation material, an estimation of the adequacy of the structural stability was inconclusive. The supporting characteristics of the foundation material were determined by in situ testing using a pressuremeter to predict the horizontal supporting characteristics of the pile-soil system. Two NX core holes were drilled through typical monoliths to obtain access to the foundation material. One other hole was drilled to sample the supporting decking, beams, and piling. the pressuremeter tests were performed and in situ soils data obtained. The horizontal soil modulus was obtained as a variation with depth into the foundation material and with soil deformation for three test positions in each of the two test holes. The horizontal modulus of subgrade reaction was then used in a three-dimensional direct stiffness analysis to determine the forces and deflections of the foundation piles. A beam on an elastic foundation analysis was performed and the pressure, moment, and deflection along the length of the most critically loaded pile were determined.

AD-A107 353/5 PC **A04**/MF **A01**
Horner and Shifrin, Inc., St. Louis, MO.
National Dam Safety Program. Crancer Lake Dam (MO 10764), Missouri - Kansas City Basin, Warren County, Missouri. Phase I Inspection Report.
Final rept.,
Harold B. Lockett, and Albert B. Becker, Jr. Sep 80, 56p
Contract DACW43-80-C-0063

Crancer Lake Dam was visually inspected by engineering personnel. The purpose of this inspection was to assess the general condition of the dam with respect to safety and, based upon this inspection and available data, determine if the dam poses a hazard to human life or property. The following report summarizes the findings of the visual inspection and the results of certain hydrologic/hydraulic investigations performed under the direction of the inspection team. Based on the visual inspection and the results of these hydrologic/hydraulic investigations, the present general condition of the dam is considered to be satisfactory. However, certain deficiencies were noticed during the inspection and are considered to have an adverse effect on the overall safety and future operation of the dam.

AD-A107 358/4 PC **A06**/MF **A01**
Engineering-Science, Inc., Atlanta, GA.
Installation Restoration Program. Phase I. Records Search, Hazardous Materials Disposal Sites. Myrtle Beach AFB, South Carolina.
Final rept.
Oct 81, 101p
Grant F08637-80-G-0009

Presented in this report are introductory background information on the Installation Restoration Program, a

description of the Myrtle Beach AFB installation including past activities, mission and environmental setting, a review of industrial activities at Myrtle Beach AFB, an inventory of major solid and hazardous waste from past activities, a review of past and present waste handling, treatment and disposal facilities, and an evaluation of the pollution potential of each identified site.

AD-A107 368/3 PC **A05**/MF **A01**
Corps of Engineers, Detroit, MI. Detroit District.
Maintenance Operations of the Federal Navigation Channels and Structures at Bolles Harbor, Michigan.
Final environmental statement.
Feb 78, 83p

Dredging and disposal activities would have temporary adverse effects on water quality, organisms living in and on the bottom sediments in affected areas, aesthetics, recreational fishing, and the ability of the area to support aquatic life. Beneficial impacts of maintenance operations include continuance of the existing local economy through preservation of navigation-dependent commercial enterprises and through recreational benefits available to regional residents and tourists. Water quality may be temporarily impacted by several of the proposed activities. The impacts would essentially be limited to turbidity and the possible release of nitrogen compounds to the waters during dredging and disposal operations. Recreationalists may be temporarily inconvenienced. In addition to maintenance dredging by bucket or hydraulic pipeline dredge, other alternatives include: (1) discontinue maintenance dredging; (2) dredge the harbor to a lesser depth; (3) alternative dredge types; and (4) dredge only the critically shoaled areas. Implementation of the alternatives could cause economic or social impacts in the Bolles Harbor area. Alternatives to the proposed disposal methods are enumerated. The only true alternative to maintenance of structures related to the navigation project is to terminate maintenance.

AD-A107 369/1 PC **A12**/MF **A01**
Corps of Engineers, Detroit, MI. Detroit District.
Confined Disposal Facility at Pointe Mouillee for Detroit and Rouge Rivers.
Final environmental statement.
Mar 74, 268p

Containment of the polluted dredge spoil will remove it as a source of pollution to the open waters of the bay. Dikes will protect Pointe Mouillee Wildlife shoreland marshes from further erosion and create additional fishing habitat. Future development and management of the site and marshlands will optimize wildlife habitats and provide recreational potential for waterfowlers and naturalists. Replacement of 700 acres of Lake Erie bottomland by the proposed structure may introduce an adverse esthetic impact on the natural landforms of the area. The dikes and management measures would create a secondary adverse impact on historical and biological relationships of the marsh to the lake. Although the structure will offer a protection against erosion from wave action, it will not prevent losses of vegetation from flooding. The function of the marsh as a spawning and feeding habitat for fish, as it existed in the 1930's, is now measurably reduced and would not resume behind the anticipated dikes. A lagoon situation behind the dikes, which would enhance conditions relative to spawning and feeding, is dependent on levels of turbidity and concentrations of pollutants that may result. Alternatives to the recommend plan include: (1) Resume open lake disposal which would return pollutants to the waterways, but such action is prohibited by request of the Governor of Michigan; (2) Discontinue dredging of polluted sediments which would reduce channel depths and curtail shipping; and (3) Use another site for disposal.

AD-A107 370/9 PC **A08**/MF **A01**
Corps of Engineers, Detroit, MI. Detroit District.
Maintenance Dredging of the Federal Navigation Channels in the Detroit River, Michigan.
Final environmental statement.
Jan 76, 163p

Resumption of the removal of polluted material will temporarily degrade the water quality and localized turbid problems are anticipated to be encountered at areas during removal of the rocky material. Disposal of the dredged material into their respective disposal sites may affect the aquatic ecosystem. Continued economic and social stability of the Great Lakes is dependent upon commercial navigation which requires maintenance dredging of the connecting channels of the Detroit River. Short-term increased turbidity and temporary water quality degradation in the area of operation are effects of maintenance dredging. Aquatic life in the dredging areas will be disturbed or destroyed. Disposal of the dredged sediments will alter existing habitats and may otherwise adversely affect organisms at the disposal areas. Dredging alternatives include: (1) alternative dredge types; (2) discontinue maintenance dredging completely; (3) dredge the connecting channels to a lesser depth; and (4) wastewater management. Implementation of the alternatives will cause economic or social impacts on the Detroit River area as well as the Great Lakes region. Alternatives to the disposal methods are examined. In terms of economic and engineering feasibility, irretrievable resources and minimal ecological disruption, the process of confined disposal of polluted materials and open water disposal for non-polluted sediments offers the best alternatives at present.

AD-A107 399/8 PC **A04**/MF **A01**
Woodward-Clyde Consultants, Chicago, IL.
National Dam Safety Program. Eaton Dam (MO 31163), Mississippi - Kaskaskia - St. Louis Basin, St. Francois County, Missouri. Phase I Inspection Report.
Final rept.,
Richard G. Berggreen, and Leonard M. Krazynski.
Apr 81, 65p
Contract DACW43-81-C-0039
Original cotnains color plates: All DTIC and NTIS reproductions will be in black and white.

This report was prepared under the National Program of Inspection of NOn-Federal Dams. This report assesses the general condition of the dam with respect to safety, based on available data and on visual inspection, to determine if the dam poses hazards to human life or property. This dam has been classified as unsafe, non-emergency by the St. Louis District as a result of the application of the following criteria: (1) Spillway will not pass 50 percent of the Probable Maximum Flood without overtopping the dam; (2) Overtopping of the dam could result in failure of the dam; and (3) Dam failure significantly increases the hazard to loss of life downstream.

AD-A107 400/4 PC **A05**/MF **A01**
Tippetts-Abbett-McCarthy-Stratton, New York.
National Dam Safety Program. Greenhaven Correction Facility Dam (Inventory Number N.Y. 11700), Lower Hudson River Basin, Duchess County, New York. Phase I Inspection Report,
Eugene O'Brien. 9 Sep 81, 94p
Contract DACW51-81-C-0008

This report provides information and analysis on the physical condition of the dam as the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Examination of the available documents and visual inspection of the Greenhaven Correction Facility Dam did not reveal conditions which constitute a hazard to human life or property. Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that the concrete gravity dam would be overtopped for all storms exceeding approximately 38.8 percent of the Probable Maximum Flood (PMF). Although the spillway capacity is inadequate from a hydraulic and hydrologic point of view, the hydraulic inadequacy will not affect the stability of the concrete dam section during overtopping nor the safety of the dam since it is supported on sound rock and overtopping will cause neither significant erosion at the toe or abutment nor undermine the foundation. In addition the dam stability is considered to be adequate against overturning and sliding. (Author)

AD-A107 401/2 PC **A03**/MF **A01**
Tippetts-Abbett-McCarthy-Stratton, New York.
National Dam Safety Program. Paterno Dam (Inventory Number N.Y. 101), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
Eugene O'Brien. 13 Aug 81, 49p
Contract DACW51-81-C-0008

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organizations. Phase I investigation of Paterno Dam did not indicate conditions which constitute an immediate hazard to human life or property. Based on engineering judgment and the performance of the dam, the project appears to be fair condition. The project, however, does have inadequacies which if not remedied, have the potential for developing into hazardous conditions. Using the Corps of Engineers Screening Criteria for review of spillway adequacy, it has been determine that the spillway is adequate for half (1/2) PMF and PMF. The spillway is therefore judged to be adequate. (Author)

AD-A107 405/3 MF **A01**
Tippetts-Abbett-McCarthy-Stratton, New York.
National Dam Safety Program. Lake Casse Dam (Inventory Number N.Y. 1156), Lower Hudson River Basin, Putnam County, New York. Phase I Inspection Report.
Eugene O'Brien. 14 Aug 81, 141p
Contract DACW51-81-C-0008
Availability: Microfiche copies only.

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. The examination of documents and the visual inspection of Lake Casse Dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action.

AD-A107 406/1 MF **A01**
Tippetts-Abbett-McCarthy-Stratton, New York.
National Dam Safety Program. North Lake Dam Number 3 (Inventory Number N.Y. 113), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
Eugene O'Brien. 14 Aug 81, 109p
Contract DACW51-81-C-0008
Includes envelope with chart.
Availability: Microfiche copies only.

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Examination of available documents and a visual inspection of the dam and the appurtenant structures did not reveal conditions which constitute an immediate hazard to human life or property. Using Corps of Engineers' Screening Criteria, it has been determined that the dam would be overtopped for all storms exceeding approximately 21 percent of Probable Maximum Flood (PMF). The spillway is, therefore, adjudged as 'seriously inadequate' and the dam is assessed as unsafe, non-emergency.

AD-A107 407/9 MF **A01**
Tippetts-Abbett-McCarthy-Stratton, New York.
National Dam Safety Program. Mamaroneck Reservoir Dam (Inventory Number N.Y. 111), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
Eugene O'Brien. 5 Aug 81, 174p
Contract DACW51-81-C-0008
Includes envelopes with charts.
Availability: Microfiche copies only.

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. The examination of documents and visual inspection findings of the dam and its appurtenant structures did not reveal conditions which constitute an immediate hazard to human life and property. However, the dam has some deficiencies which require further investigations and remedial action.

AD-A107 408/7 MF **A01**
Tippetts-Abbett-McCarthy-Stratton, New York.
National Dam Safety Program. Kirk Lake Dam (Inventory Number N.Y. 682), Lower Hudson River Basin, Putnam County, New York. Phase I Inspection Report,
Eugene O'Brien. 13 Aug 81, 105p
Contract DACW51-81-C-0008
Availability: Microfiche copies only.

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. The examination of documents and the visual inspection of Kirk Lake Dam did not reveal conditions which constitute an immediate hazard to human life or property.

However, the dam has some deficiencies which require further investigation and remedial action.

AD-A107 409/5 MF **A01**
Tippetts-Abbett-McCarthy-Stratton, New York.
National Dam Safety Program. White Plains Reservoir Dam Number 2 (Inventory Number N.Y. 24), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
Eugene O'Brien. 5 Aug 81, 91p
Contract DACW51-81-C-0008
Availability: Microfiche copies only.

Examination of available documents and a visual inspection of the dam and the appurtenant structures did not reveal conditions which constitute an immediate hazard to human life or property. The classification of 'unsafe' applied to a dam because of a 'seriously inadequate spillway' is not meant to connote the same degree of emergency as would be associated with an 'unsafe' classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard to loss of life downstream from the dam.

AD-A107 410/3 MF **A01**
Tippetts-Abbett-McCarthy-Stratton, New York.
National Dam Safety Program. Long Pond Dam Number 3 (Inventory Number NY 115), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
Eugene O'Brien. Sep 81, 144p
Contract DACW51-81-C-0008
Availability: Microfiche copies only.

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Examination of available documents and a visual inspection of the dam and the appurtenant structures did not reveal conditions which constitute an immediate hazard to human life or property. Using Corps of Engineers' Screening Criteria, it has been determined that the dam would be overtopped for all storms exceeding approximately 41 percent of Probable Maximum Flood (PMF). The service spillway is, therefore, adjudged as 'seriously inadequate' and the dam is assessed as unsafe, non-emergency. The classification of 'unsafe' applied to a dam because of a 'seriously inadequate spillway' is not meant to connote the same degree of emergency as would be associated with an 'unsafe' classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard to loss of life downstream from the dam. (Author)

AD-A107 411/1 MF **A01**
Flaherty-Giavara Associates, New Haven, CT.
National Dam Safety Program. Norwich Water Works Dam Number 1 (Inventory Number NY 347), Susquehanna River Basin, Chenango County, New York. Phase I Inspection Report,
Hugh C. Flaherty. 4 Aug 81, 252p
Contract DACW51-81-C-0006
Availability: Microfiche copies only.

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies that need to be evaluated and remedied. Using the Corps of Engineers' screening criteria for the initial review of spillway adequacy, it has been determined that the embankment would be overtopped by the outflow resulting from all storms exceeding 17 percent of the Probable Maximum Flood (PMF) when the flashboards are in place and the overtopping discharge from the embankment portion of Norwich Reservoir No. 2 Dam (NY 349) is included as an inflow hydrograph. Dam overtopping, the resulting erosion of the embankment and hence, dam breaching would cause water surface levels downstream to reach depths which would pose significant danger to residents. Therefore, the spillway is adjudged to be seriously inadequate and the dam is assessed as unsafe, nonemergency.

AD-A107 412/9 MF **A01**
Flaherty-Giavara Associates, New Haven, CT.
National Dam Safety Program. Larchwood Lake Dam (Inventory Number NY 727), Susquehanna River Basin, Otsego County, New York. Phase I Inspection Report,
Hugh C. Flaherty. 4 Aug 81, 195p
Contract DACW51-81-C-0006
Availability: Microfiche copies only.

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies that need to be evaluated and remedied. Hydrologic/hydraulic analyses performed in accordance with the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams indicate that the principal spillway and the emergency spillway would pass 100 percent of the outflow from the Probable Maximum Flood (PMF) without overtopping the dam. Therefore, the combined spillway capacity is adjudged to be adequate. (Author)

AD-A107 413/7 MF **A01**
Flaherty-Giavara Associates, New Haven, CT.
National Dam Safety Program. Robert L. Bishop Dam (Inventory Number N.Y. 534), Delaware River Basin, Delaware County, New York. Phase I Inspection Report,
Hugh C. Flaherty. 4 Aug 81, 147p
Contract DACW51-81-C-0006
Availability: Microfiche copies only.

Examination of available documents and visual inspections of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies that need to be evaluated and remedied. The classification 'unsafe' applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an 'unsafe' classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to life downstream from the dam.

AD-A107 414/5 MF **A01**
Flaherty-Giavara Associates, New Haven, CT.
National Dam Safety Program. Norwich Reservoir Number 2 Dam (Inventory Number NY 349), Susquehanna River Basin, Chenango County, New York. Phase I Inspection Report,
Hugh C. Flaherty. 4 Aug 81, 194p
Contract DACW51-81-C-0006
Availability: Microfiche copies only.

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies that need to be evaluated and remedied. Using the Corps of Engineers' Screening Criteria for the initial review of spillway adequacy, it has been determined that the embankment would be overtopped by the outflow resulting from all storms exceeding 13 percent of the Probable Maximum Flood (PMF). Dam overtopping, the resulting erosion of the embankment and hence, dam breaching would cause water surface levels downstream to reach depths which would pose significant danger to residents. Therefore, the spillway is adjudged to be seriously inadequate and the dam is assessed as unsafe, nonemergency. (Author)

AD-A107 416/0 MF **A01**
Schnabel Engineering Associates, Richmond, VA.
National Dam Safety Program. Leatherwood Creek Number 5 (Inventory Number VA 08902), Roanoke River Basin, Henry County, Virginia. Phase I Inspection Report.
Final rept.,
Carl S. Anderson, Jr., Jack G. Starr, and Ray E. Martin. Jul 81, 85p
Contract DACW65-81-D-0020
Prepared in cooperation with Timmons (J.K.) and Associates, Inc.
Availability: Microfiche copies only.

The purpose of a Phase I inspection is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general conditions of the dam is based upon available data and visual inspection. Based upon the field conditions at the time of the field inspection and all available engineering data, the Phase I report addresses the hydraulic, hydrologic, geologic, geotechnic, and structural aspects of the dam. Phase I reports include project information of the dam appurtenances, all existing engineering data, operational procedures, hydraulic/hydrologic data of the watershed, dam stability, visual inspection report and on assessment including required remedial measures. The spillways will pass 30 percent of the Probable Maximum Flood (PMF) or 60 percent of the SDF without overtopping the dam. During the SDF, the dam will be overtopped for a period of 5.5 hours up to a maximum of 1.8 feet and reach a maximum velocity of 5.9 fps. Flows overtopping the dam during the SDF are not considered detrimental to the embankment with respect to erosion. The spillway is judged inadequate, but not seriously inadequate. The visual inspection did not reveal any problems which would require immediate attention. A summary of the design stability analyses for the upstream slope under drawdown conditions and the downstream slope under steady seepage conditions were reviewed and found to be acceptable.

AD-A107 417/8 MF **A01**
Tippetts-Abbett-McCarthy-Stratton, New York.
National Dam Safety Program. Byram Lake Reservoir Dam (Inventory Number N.Y. 1175), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
Eugene O'Brien. 13 Aug 81, 143p
Contract DACW51-81-C-0008
Availability: Microfiche copies only.

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. The examination of documents and the visual inspection findings of Byram Lake Dam did not reveal conditions which constitute an immediate hazard to life and property. However, the dam has some deficiencies which require further investigation and remedial action. Using the Corps of Engineers screening criteria for initial review of the spillway adequacy, it has been determined that the dam would be overtopped by all floods exceeding 61 percent of the PMF. The maximum spillway discharge capacity is 18.4 percent of the peak PMF outflow. The spillway is therefore judged to be inadequate. The structural stability analysis based on available information, assumed strength parameters and material properties and visual inspection indicates that the dam is inadequate in overturning and sliding for all loading conditions except for the normal loading. (Author)

AD-A107 418/6 MF **A01**
Tippetts-Abbett-McCarthy-Stratton, New York.
National Dam Safety Program. Lake Carmel Dam (Inventory Number N.Y. 100), Lower Hudson River Basin, Putnam County, New York. Phase I Inspection Report,
Eugene O'Brien. 13 Aug 81, 122p
Contract DACW51-81-C-0008
Availability: Microfiche copies only.

This report provides information and analysis on the physical condition of the dam as the report date. Information and analysis are based on visual inspection of the dam by the performing organization. The examination of documents and the visual inspection findings of the dam and its appurtenant structures did not reveal conditions which constitute an immediate hazard to human life and property. However, the dam has some deficiencies which require further investigations and remedial action. Using the Corps of Engineers' screening criteria for initial review of the adequacy of the service spillway, it has been determined that the structure is inadequate for all floods in excess of 17.5 percent of the Probable Maximum Flood (PMF). Overtopping of the dam could cause breaching the embankment section of the dam: this would significantly increase the

hazard of loss of life and property. The spillway section is therefore judged to be 'seriously inadequate' and the dam is assessed as unsafe, non-emergency. Based on an initial screening and the service spillway capacity, such that if a severe storm were to occur, overtopping would significantly increase the hazard to life downstream of the dam.

AD-A107 419/4 MF **A01**
Tippetts-Abbett-McCarthy-Stratton, New York.
National Dam Safety Program. Blind Brook Country Club Dam (Inventory Number N.Y. 123), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
Eugene O'Brien. 5 Aug 81, 105p
Contract DACW51-81-C-0008
Availability: Microfiche copies only.

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. The examination of documents and the visual inspection of Blind Brook Dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigations and remedial actions. It has been determined that the dam would be overtopped for all storms exceeding approximately 17 percent of the Probable Maximum Flood (PMF). The spillway is therefore adjudged as seriously inadequate and the dam is assessed as unsafe, non-emergency. Based on an initial screening and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard for loss of life downstream from the dam. The structural stability analysis based on available information, assumed strength parameters and visual inspection indicates that the stability against sliding and overturning of the spillway section of the dam is inadequate for normal loading cases and marginal during floods greater than 25 percent of the PMF.

AD-A107 420/2 MF **A01**
Tippetts-Abbett-McCarthy-Stratton, New York.
National Dam Safety Program. Sparkle Lake Dam (Inventory Number N.Y. 1330), Lower Hudson River Basin, Westchester County, New York. Phase I Inspection Report,
Eugene O'Brien. 14 Aug 81, 77p
Contract DACW51-81-C-0008
Availability: Microfiche copies only.

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. The examination of documents and visual inspection of Sparkle Lake Dam and appurtenant structures did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action. Using Corps of Engineers screening criteria for initial review of spillway adequacy, it has been determined that the dam would be overtopped for all storms exceeding 48 percent of Probable Maximum Flood (PMF). The overtopping of the dam could cause the erosion of both abutments and the downstream face of the dam resulting in dam failure, thus significantly increasing the hazard to life and property downstream. The pipe spillway is, therefore adjudged as seriously inadequate and the dam is assessed as unsafe, non-emergency.

AD-A107 421/0 MF **A01**
Tippetts-Abbett-McCarthy-Stratton, New York.
National Dam Safety Program. Lake Lincolndale Dam (Inventory Number N.Y. 102), Lower Hudson River Basin, Westchester County, New York. Phase I Inspection Report,
Eugene O'Brien. 30 Jul 81, 82p
Contract DACW51-81-C-0008
Availability: Microfiche copies only.

The examination of documents and the visual inspection findings of Lake Lincolndale Dam and its appurtenant structures did not reveal conditions which constitute an immediate hazard to human life and property. However, the dam has some deficiencies which require further investigations and remedial action. It has been determined that the concrete sill structure is inadequate for all floods in excess of 31 percent of the Probable Maximum Flood (PMF). Overtopping of the dam could cause breaching of the embankment which would significantly increase the hazard to loss of life and property. The spillway is therefore judged to be 'seriously inadequate ' and the dam is assessed as unsafe.

AD-A107 435/0 PC **A12**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Control of Air Pollution from Aviation: The Emission Standard Setting Process.
Doctoral thesis,
Dennis Freeman Naugle. 1981, 260p Rept no. AFIT-CI-81-26D

Air pollutant emissions from aviation sources are a small but increasing part of all emissions on a national scale. The United States Environmental Protection Agency first issued emission standards for aircraft engines in 1973 and has repeatedly changed the control regulations since that time. Critics claim the standards are too stringent and do not solve any real air pollution problems. Proponents argue that ambient air standards for oxidants and other pollutants are frequently violated and will not be achieved unless control technology is applied to many sources - including those the size of airports. The objective of this research is to evaluate the potential effects of aviation on ambient air quality with special emphasis on the requirement and techniques for setting aviation control standards. A logical framework called the 'hypothesis decision model' was developed. It offers a structured way of dealing with complex issues. Application of the model focuses on aircraft sources but a generic version is also proposed. Adoption would explicitly document the manner that technical evidence is considered in a variety of decisions concerning the establishment of emission standards.

AD-A107 486/3 MF **A01**
Black and Veatch, Kansas City, MO.
National Dam Safety Program. Burton-Duenke Dam Number 5 (MO 31608), Missouri - Osage - Gasconade Basin, Camden County, Missouri. Phase I Inspection Report.
Final rept.,
Edwin R. Burton, and Harry L. Callahan. Apr 81, 66p
Contract DACW43-81-C-0037
Availability: Microfiche copies only.

The dam is an earth structure approximately 450 feet long along the crest and 43 feet high. The dam crest is 49 feet wide. The spillway is an uncontrolled 18-inch corrugated metal pipe installed in the embankment. There is no emergency spillway. Well water is pumped into the lake through a valved 2-inch plastic pipe. Our inspection and evaluation indicates the spillway does not meet the criteria set forth in the guidelines for a dam having the above size and hazard potential. The spillway will not pass the probable maximum flood without overtopping but will pass 15 percent of the probable maximum flood. Based on visual observations, this dam appears to be in satisfactory condition. Deficiencies visually observed by the inspection team were seepage on the downstream slope, at the toe, and on both abutments, erosion on the upstream and downstream slopes and at the interface of the right abutment and the upstream slope, small trees on the upstream and downstream slopes, the very thin ground cover and poor drainage on the crest.

AD-A107 487/1 MF **A01**
Black and Veatch, Kansas City, MO.
National Dam Safety Program. Kehr's Mill Trail Upper Dam (MO 11636), Missouri - Kansas City Basin, St. Louis County, Missouri. Phase I Inspection Report.
Final rept.,
Edwin R. Burton, and Harry L. Callahan. Nov 80, 99p
Contract DACW43-80-C-0074
Availability: document partially illegible.

The dam is an earth structure approximately 450 feet long along the curved alignment of the crest and is 30 feet high. The dam crest is 47 feet wide. The spillway consists of twin 36-inch corrugated metal pipes with beveled ends installed through the embankment. The beveled inlet and outlet ends of the pipes are encased in unformed poured concrete. Flow through the pipes will discharge onto a 12-foot wide concrete chute to the lower lake. There is no emergency spillway for this dam. Our inspection and evaluation indicates that the spillway does not meet the criteria set forth in the guidelines for a dam having the above size and hazard potential. The spillway will not pass the probable maximum flood without overtopping the dam but will pass 10 percent of the probable maximum flood. Based on visual observations, this dam appears to be in satisfactory condition. Deficiencies visually observed by the inspection team were erosion of the upstream face, crest, and downstream toe, trees on the downstream face, undercutting and cracking of the concrete spillway chute, and poor vegetal cover on the embankment.

AD-A107 504/3 PC **A05**/MF **A01**
International Engineering Co., Inc., San Francisco, CA.
National Dam Safety Program. Black Tailings Dam (MO 31154), Mississippi - Kaskaskia - St. Louis Basin, Washington County, Missouri. Phase I Inspection Report.
Final rept.,
Kenneth B. King, James H. Gray, and Donald E. Westcott. Aug 79, 77p
Contract DACW43-79-C-0037

This report presents the results of field inspection and evaluation of the Black Tailings Dam. This dam has been classified as unsafe, emergency by the St. Louis District as a result of the application of the following criteria: (1) This dam which has no spillway will not contain a 10-year frequency flood without overtopping occurring. The storage capacity of this dam is, therefore, considered to be unusually small and seriously inadequate; (2) Overtopping could result in dam failure; and (3) Dam failure would significantly increase the hazard to life and property downstream.

AD-A107 540/7 PC **A04**/MF **A01**
Hoskins-Western-Sonderegger, Inc., Lincoln, NE.
National Dam Safety Program. MO Noname 27 Dam (MO 10353), Missouri - Nemaha - Nodaway Basin, Holt County, Missouri. Phase I Inspection Report.
Final rept.,
Rey S. Decker, Gordon Jamison, Garold Ulmer, and Harold P. Hoskins. May 79, 54p
Contract DACW43-79-C-0046

This report presents the results of field inspection and evaluation of the Mononame 27 Dam: It was prepared under the National Program of Inspection of Non-Federal Dams. This dam has been classified as unsafe, non-emergency by the St. Louis District as a result of the application of the following criteria: Spillway will not pass 50 percent of the Probable Maximum Flood. Overtopping could result in dam failure. Dam failure significantly increases the hazard to loss of life downstream. (Author)

AD-A107 542/3 PC **A03**/MF **A01**
Black and Veatch, Kansas City, MO.
National Dam Safety Program. No Name 165 (Crystal Lake Dam) (MO 10580), Missouri - Kansas City Basin, Jackson County, Missouri. Phase I Inspection Report.
Final rept.,
Paul R. Zaman, Bruce A. Ainsworth, and Harry L. Callahan. Jul 78, 42p
Contract DACW43-78-C-0148

Crystal Lake Dam was inspected by a team of engineers. The purpose of the inspection was to make an assessment of the general condition of the dam with respect to safety, based upon available data and visual inspection, in order to determine if the dam poses hazards to human life or property. Our inspection and evaluation indicates the spillway does meet the criteria set forth in the guidelines for a dam having the above size and hazard potential. The spillway will pass the probable maximum flood without overtopping. It should be noted that a flood of this magnitude would inundate major portions of Excelsior Springs, Missouri as indicated in the Flood Insurance Study for Excelsior Springs, Missouri, U.S. Department of Housing and Urban Development, Federal Insurance Administration.

AD-A107 543/1 PC **A03**/MF **A01**
International Engineering Co., Inc., San Francisco, CA.
National Dam Safety Program. No Name 548 Pfizer Inc. Dam (MO 30705), Mississippi - Kaskaskia - St. Louis Basin, Washington County, Missouri. Phase I Inspection Report.
Final rept.,
Kenneth B. King, Michael P. Forrest, and Donald R. Sanders. Jun 79, 48p
Contract DACW43-79-C-0037

This report presents the results of field inspection and evaluation of the Pfizer Inc. Dam. It was prepared

under the National Program of Inspection of Non-Federal Dams. This dam has been classified as unsafe, non-emergency by the St. Louis District as a result of: the spillway can only pass 9 percent of the PMF without significant erosion of the spillway or embankment; erosion of the open channel spillway through the embankment near the left abutment is taking place in the upstream direction and is encroaching on the toe of the dam; and excessively steep downstream slope. (Author)

DE81032000 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Environmental Impacts Associated with Using Peat for Energy.
R. M. Reed, L. D. Voorhees, and P. J. Mulholland.
1981, 12p CONF-810909-8
Contract W-7405-ENG-26
International gas research conference, Los Angeles, CA, USA, 28 Sep 1981.

Peat is an attractive energy alternative in the north-central states and on the southeastern coastal plain because: (a) it provides an indigenous supply of energy; (b) it is found in surface deposits and therefore can be easily mined; (c) the technologies to convert peat to useable energy are either proven or appear to be feasible; and (d) attractive possibilities exist for converting mined peatlands to productive agricultural or silvicultural use. The major environmental constraints associated with development of peatlands are related to disruption of important regional wetland ecosystems in terms of (a) ground and surface water hydrology; (b) water and air quality; (c) critical habitat for species of limited distribution; and (d) unique ecosystems that have important scientific and educational values. Development of peat resources for energy can be accomplished in an environmentally acceptable manner but will require detailed environmental planning and evaluation of these important regional ecosystems. (ERA citation 06:034246)

DE82000514 PC **A02**/MF **A01**
Western Solar Utilization Network, Portland, OR.
Air Pollution from Residential Woodburning Appliances: An Annotated Bibliography.
J. Shelton. Aug 80, 25p WSUN-28
Contract AC02-79CS30159

This bibliography has been separated into 6 categories: a general overview; measured emissions and measured ambient air quality; state, regional and local stuies; solutions; other issues; current research. The bibliography is selective however, an attempt is made to include all works of major importance in the area of wood fuel combustion. (ERA citation 06:035432)

DOE/EA-0061 PC **A06**/MF **A01**
Department of Energy, Washington, DC. Economic Regulatory Administration.
Environmental Assessment: Allocation of Petroleum Feedstock, Columbia LNG Corporation, Green Springs SNG Plant, Green Springs, Seneca County, Ohio.
Aug 78, 115p
Contract AC01-77RG08753

DOE is considering an extended period allocation of liquid petroleum feedstocks for use in the production of SNG by Columbia Liquid Natural Gas (LNG) Corporation (Columbia LNG) in its Green Springs, Ohio, Gas Reforming Plant. The purpose of this report is to assess the degree to which the requested allocation, if granted, would constitute a major federal action that would significantly affect the quality of the human environment within the meaning of Section 102 (2) (c) of the National Environmental Policy Act of 1969 (NEPA). This environmental assessment (EA) will be used as a basis for determining whether an environmental impact statement (EIS) is required before the DOE makes a feedstock allocation decision or whether a negative determination is appropriate. (ERA citation 05:033269)

LA-UR-80-1753 PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Air Quality Regulation in Spatial Equilibrium Models.
C. D. Kolstad. 1980, 27p CONF-801015-1
Contract W-7405-ENG-36
International clean air congress, Buenos Aires, Argentina, 20 Oct 1980.

A discussion is presented of methods for including a wide variety of air pollution regulations within the class of economic equilibrium models where allocation is based on constrained optimization. The first part of the paper discusses current air pollution regulation in the United States and possible future regulation. This is followed by the presentation of a prototype spatial equilibrium model within which a number of regulatory mechanisms are explicitly represented. These include efficient and zoned charges, statically and dynamically efficient permit systems, technological control and hybrid permit/charge systems. (ERA citation 05:034141)

LBL-11072 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Potential Uses of Spent Shale in the Treatment of Oil Shale Retort Waters.
J. P. Fox, D. E. Jackson, and R. H. Sakaji. Jun 80, 12p CONF-800425-6
Contract W-7405-ENG-48
13. oil shale symposium, Golden, CO, USA, 16 Apr 1980.

This paper evaluates two potential uses of spent shale for the treatment of in-situ oil shale process waters - in-situ treatment in an abandoned retort and surface treatment by columns of spent shale. Batch and column studies were conducted using four in-situ retort waters, one gas condensate, and six spent shales. The effect of spent shale contact on the organic and inorganic carbon, conductivity, and pH of the waters was determined and related to specific surface area of the shale and retort operating conditions. These studies indicate that spent shale may be used to reduce the organic and inorganic carbon, conductivity, color, and odor and to elevate the pH of retort waters and gas condensate. Spent shale reduces the inorganic carbon by 47 to 98%, the organic carbon by 7 to 66%, and elevates the pH from initial levels of 8 to 9 up to 10 to 11. TOSCO II spent shale was the best adsorbent for organic carbon, while Lurgi and simulated in-situ spent shales achieved the highest inorganic carbon reduction. These results suggest that a packed bed of spent shale could be placed ahead of an ammonia removal step in a retort water treatment system. The increase in pH achieved by the spent shale column would convert ammonium to ammonia which could be readily stripped. The simultaneous reduction in electrical conductivity and dissolved organic and inorganic carbon by the spent shale column would decrease the load of these constituents on subsequent treatment steps. (ERA citation 05:033299)

LBL-9809 PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Combustion Research. Chapter from the Energy and Environment Division Annual Report 1978.
Oct 79, 43p
Contract W-7405-ENG-48

The research programs described are aimed at developing a better understanding of the various fluid mechanical and chemical processes which are thought to be of critical importance in reducing pollutant formation. Principal program areas are the interaction of fluid mechanical turbulence with combustion reactions, important phenomena and pollutant generating processes associated with internal combustion engines, fire safety and flame spread, and diagnostics and formation mechanisms associated with the generation of nitrogen containing pollutants. (ERA citation 05:004796)

N82-11145/1 PC **A08**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Coal Desulfurization by Low Temperature Chlorinolysis, Phase 3.
Technical Report, 1 Mar. 1980 - 1 Mar. 1981.
J. Kalvinskas, N. Rohatgi, and J. Ernest. 1 Mar 81, 170p NASA-CR-164957, JPL-PUB-81-82
Contract DE-AI01-77ET-12547
Sponsored by NASA.

Laboratory scale, bench scale batch reactor, and mini-pilot plant tests were conducted on 22 bituminous, subbituminous, and lignite coals. Chemical pretreatment and post treatment of coals relative to the chlorination were tried as a means of enhancing desulfurization by the chlorinolysis process. Elevated temperature (500-700 C) hydrogen treatment of chlorinolysis-processed coal at atmospheric pressure was found to substantially increase coal desulfurization up to 90 percent. Sulfur forms, proximate and ultimate analyses of the processed coal are included. Minipilot plant operation indicates that the continuous flow reactor provides coal desulfurization results comparable to those obtained in the batch reactor. Seven runs were conducted at coal feed rates of 1.5 to 8.8 kg per hour using water and methylchloroform solvents, gaseous chlorine feed of 3 to 31.4 SCFH at 21 to 70 C, and atmospheric pressure for retention times of 20 to 120 minutes.

N82-11635/1 PC **A06**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
Shuttle Applications in Tropospheric Air Quality Observations.
Final Report.
E. Friedman, J. Gupta, and J. Carmichael. Aug 78, 122p NASA-CR-145374
Contract F19628-78-C-001
Sponsored by NASA.

The role which might be played by the space shuttle in obtaining data which describes the air quality of the north-eastern United States was investigated. The data requirements of users, a model for statistical interpretation of the observations, the influence of orbit parameters on the spatial and temporal sampling and an example of application of the the model were considered.

N82-11991/8 PC **A03**/MF **A01**
Boeing Aerospace Co., Houston, TX.
Automated Water Monitor System Field Demonstration Test Report. Volume 1: Executive Summary.
R. L. Brooks, E. L. Jeffers, J. Perreira, J. D. Poel, and D. Nibley. 30 Sep 81, 48p NASA-CR-166228
Contract NAS2-9885

A system that performs water quality monitoring on-line and in real time much as it would be done in a spacecraft, was developed and demonstrated. The system has the capability to determine conformance to high effluent quality standards and to increase the potential for reclamation and reuse of water.

N82-11992/6 PC **A14**/MF **A01**
Boeing Aerospace Co., Houston, TX.
Automated Water Monitor System Field Demonstration Test Report. Volume 2: Technical Summary.
R. L. Brooks, E. L. Jeffers, J. Perreira, J. D. Poel, and D. Nibley. 30 Sep 81, 313p NASA-CR-166229
Contract NAS2-9885

The NASA Automatic Water Monitor System was installed in a water reclamation facility to evaluate the technical and cost feasibility of producing high quality reclaimed water. Data gathered during this field demonstration test are reported.

ORNL/Sub-7384/1 PC **A12**/MF **A01**
Chem Systems, Inc., New York.
Comparative Cost Estimates of Five Coal Utilization Processes.
Jan 79, 256p
Contract W-7405-ENG-26

Detailed capital and operating cost estimates were prepared for the generation of electric power in a new, net 500 MW (e), coal-burning facility by five alternative processes: conventional boiler with no control of SO sub 2 emissions, atmospheric fluidized bed steam generator (AFB), conventional boiler equipped with a limestone FGD system, conventional boiler equipped with magnesia FGD system, and coal beneficiation followed by a conventional boiler quipped with limestone FGD for part of the flue gas stream. For a coal containing 3.5% sulfur, meeting SO sub 2 emission limits of 1.2 pounds per million Btu fired was most economical with the limestone FGD system. This result was unchanged for a coal containing 5% sulfur; however, for 2% sulfur, limestone FGD and AFB were competitive methods of controlling SO sub 2 emissions. Brief consideration of 90% reduction of SO sub 2 emissions led to the choice of limestone FGD as the most economical method. Byproduct credit for the sulfuric acid produced in regenerating the magnesia could make that system competitive with the limestone FGD system, depending upon local markets. The cost of sludge fixation and disposal would make limestone FGD noneconomic in many situations, if these steps are necessary. (ERA citation 04:049853)

PB82-106428 PC **A10**/MF **A01**
Environmental Protection Agency, Atlanta, GA. Region IV.

Tallahassee-Leon County Wastewater Management, Tallahassee, Leon County, Florida.
Draft Environmental Impact Statement.
Sep 81, 213p Rept no. EPA-904/9-81-082

This Draft EIS has been prepared in response to issues raised in opposition to portions of the Tallahassee-Leon County 201 Facilities Plan. The EIS addresses wastewater management needs for growth areas which will not be served by 201 facilities already approved by EPA. Alternatives for wastewater management in the study area were developed and evaluated with emphasis on protection of the groundwater resources and sensitive natural systems such as floodplains and wetlands. The Draft EIS preferred alternative includes the expansion of the existing system until the approved facilities have been constructed. New growth in wastewater generation will be handled by on-site systems, small community systems, and by tying into the existing system.

PB82-107517 PC **A09**/MF **A01**
New England River Basins Commission, Boston, MA.
Saco and Southern Maine Coastal River Basins Overview.
27 Oct 80, 177p
Sponsored in part by Water Resources Council, Washington, DC.

The Saco and Southern Maine Coastal River basins drain 1,698 square miles in southern Maine and New Hampshire. The coastal belt, with its rapid population growth and heavy recreational use, experiences water related problems with insufficient public water supplies, flood hazards on the coastal flood plain, and water pollution. In the less developed northern basin, management is needed to protect the flood plain, to prevent problems associated with recreational overuse of the Savo River, and to meet increasing demands for forest harvesting. The report recommends coordination of several proposed planning efforts, particularly the USDA Cooperative River Basin Study. This Overview, one of a series of 14 such reports, assesses issues related to eight water resource demands and recommends next steps in planning and management.

PB82-107566 PC **A05**/MF **A01**
Research Triangle Inst., Research Triangle Park, NC.
Treatability Studies of Pesticide Manufacturing Wastewaters: Ethylenebisdithiocarbamate Fungicides.
Final rept. Jan-Mar 80,
Ruth A. Zweidinger, Rosemary Batten, R. Wayne Hendren, Linda W. Little, and Dora Liverman. Dec 80, 83p EPA-600/2-80-077E, IERL-RTP-1254
EPA-68-02-2688
See also report for Feb 78-Mar 80, PB81-159097.

The report gives results of laboratory and pilot studies on the biological treatability of wastewaters from the manufacture of ethylenebisdithiocarbamate (EBDC) fungicide. At concentration levels representative of EBDC production units and total plant wastewaters discharged to publicly owned treatment works (POTWs) (1 mg/L), results indicate little reduction in EBDC levels or in ethylene thiourea (ETU), an important decomposition product of EBDC as a result of biological treatment. Results of algal (Selenastrum capricornutum) and fish (Daphnia magna) bioassays on the treated wastewater indicated inhibition of algal growth and fish mobility, although little toxicity was indicated. Chemical oxygen demand (COD) removal by the biological (activated sludge) treatment unit was unaffected by the fungicide wastewater, although nitrification was reduced or absent in these units.

PB82-107723 PC **A09**/MF **A01**
Environmental Protection Agency, Research Triangle Park, NC. Office of Air Quality Planning and Standards.
Compilation of Air Pollutant Emission Factors, Third Edition, Supplement 12.
Apr 81, 192p AP-42-ED-3-SUPPL-12
See also Supplement no. 11, PB81-178014.

In this Supplement for AP-42, revised or updated emissions data are presented for Dry Cleaning; Surface Coating; Storage of Organic Liquids; Solvent Degreasing; Graphic Arts; Consumer/commercial Solvent Use; Sulfuric Acid; Beer Making; Ammonium Sulfate; Primary Aluminum; Secondary Aluminum; Gray Iron Foundries; Steel Foundries; Secondary Zinc; Asphaltic Concrete; Asphalt Roofing; NEDS Source Classification Codes and Emission Factor Listing; and Table of Lead Emission Factors.

PB82-107863 PC **A03**/MF **A01**
Environmental Protection Agency, Research Triangle Park, NC. Office of Air Quality Planning and Standards.
Questions and Responses at the 1981 Workshops on Procedures to Demonstrate Attainment of the NAAQS (National Ambient Air Quality Standards) for Ozone in the 1982 SIPs (State Implementation Plans).
Final rept.,
Edwin L. Meyer, Gerald L. Gipson, and Robert F. Kelly. Sep 81, 44p EPA-450/4-81-030

Report presents responses to 166 questions asked at three 1981 workshops describing the basis and application of city-specific EKMA. Subject matter discussed includes the conceptual basis for EKMA, implications of the statistical form of the ozone NAAQS, monitoring support needed for EKMA analyses, generation and application of ozone isopleth diagrams and results of efforts to validate EKMA.

PB82-107871 PC **A03**/MF **A01**
Environmental Protection Agency, Research Triangle Park, NC. Office of Air Quality Planning and Standards.
Permit Fee Guideline.
Final rept.,
Joseph Sableski, Dan deRoeck, Kevin Hannon, and Ray Freeman. Sep 81, 34p EPA-450/2-81-003

The guideline was developed to assist States in making revisions to their State Implementation Plans (SIPs) to address the permit fee requirements of the Clean Air Act. The guideline is designed for both agencies that have no functioning fee systems, and for those agencies currently revising and upgrading existing fee systems. The guideline includes a review of the Clean Air Act requirement for permit fees, legislative history and relevant court cases, costs to be considered, basic program implementation considerations, and examples of fee systems currently in effect around the country.

PB82-108838 PC **A09**/MF **A01**
Environmental Protection Agency, Atlanta, GA. Region IV.
Wastewater Facilities Southern Region Area, Palm Beach County, Florida.
Draft environmental impact statement.
Sep 81, 192p EPA-904/9-81-083

This Draft Environmental Impact Statement (EIS) addresses proposed wastewater facilities for the City of Boca Raton, Florida and adjacent areas of unincorporated Palm Beach County. Ten wastewater management alternatives have been evaluated with particular attention to water quality in the area's surface and groundwater resources and the impacts of projected population growth on the natural and human resources of the Southern Palm Beach County Area.

PB82-109430 PC **A14**/MF **A01**
Bureau of Land Management, New Orleans, LA. New Orleans Outer Continental Shelf Office.
Proposed Gulf of Mexico OCS Oil and Gas Sales 67 and 69.
Environmental impact statement (Final).
Aug 81, 315p BLM/YM/ES-81-004-1792
Errata sheet inserted.

This Environmental Impact Statement (EIS) is a description of the environmental aspects and impacts of oil and gas activities resulting from these sales for the states bordering the Gulf of Mexico. It provides a description of the area, affected environment, and environmental consequences; it discusses the proposed action, issues and areas of concern, and the major alternatives of holding these sales.

PB82-126319 PC **A02**/MF **A01**
Denver Research Inst., CO.
Tethered Balloon Sampling Systems for Monitoring Air Pollution.
Journal article,
James A. Armstrong, Phillip A. Russell, Leslie E. Sparks, and Dennis C. Drehmel. 1981, 12p EPA-600/J-81-383
Grant EPA-R-804829
Pub. in Jnl. of the Air Pollution Control Association, v31 n7 p735-743 Jul 81.

The paper is an overview of recent studies in which balloons, usually tethered, have been used to investigate the structure and air quality of the planetary boundary layer. It also describes a number of lightweight tethered balloon sampling systems, developed to investigate particulate and gaseous emissions from point and nonpoint sources. The sampling systems have both vertical and horizontal mobility and sample at specified altitudes for extended periods of time. Two of the balloon-borne samplers are remote controlled and have been used to monitor emissions in the plumes of point sources. A third sampler has been developed to investigate the vertical extent and downwind transport of particle emissions from fugitive sources. A fourth sampler, currently being developed, is also described.

PB82-127960 PC **A02**/MF **A01**
Environmental Protection Agency, Ann Arbor, MI. Control Technology Assessment and Characterization Branch.
Nitrosamines and Other Hazardous Emissions from Engine Crankcases.
Technical rept.,
Thomas M. Baines. Jun 81, 15p EPA/AA/CTAB/PA/81-15

The emissions from heavy duty Diesel crankcases contain a number of hazardous compounds. Research has discovered some of them and it may be possible that there are some that have not yet been quantified. Nitrosamines (a potent carcinogen in animals and probably also in humans) are emitted from engines using fresh oil. These emissions seem to be a function of the type of oil used and some engine parameters such as crankcase flow rate of NOx compounds. Used lubricating oil has been shown to contain carcinogenic compounds such as benzo-a-pyrene. It has also been shown to be mutagenic. Therefore it can be concluded that the particulate portion of the crankcase effluent stream may start out after an oil change at a level containing few carcinogenic compounds but the level of these compounds increases with time. In conclusion, crankcases emit a variety of hazardous chemicals and evaluation of the costs and benefits of the control of these emissions should be seriously considered.

PB82-128091 PC **A03**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Accident Investigation.
Railroad Accident Report: Brief Format Number 5, 1979.
5 Oct 81, 44p NTSB-RAR-81-3

The publication contains briefs of selected railroad accidents occurring in U.S. Railroad operations during calendar year 1979 and some from calendar year 1977 and 1978. The brief format presents basic facts, conditions, circumstances, and probable cause(s) in each instance. Additional statistical information is tabulated by types of accidents and casualties related to types of accidents, carriers involved, and causal factors.

PB82-128109 PC **A08**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Accident Investigation.
Railroad Accident Report: Brief Format Issue Number 1, 1980.
14 Oct 81, 152p NTSB-RAR-81-4

The publication contains briefs of selected railroad accidents occurring in U.S. Railroad operations during calendar year 1980 and some from November and December 1979. The brief format presents basic facts, conditions, circumstances, and probable cause(s) in each instance. Additional statistical information is tabulated by types of accidents and casualties related to types of accidents, carriers involved, and causal factors.

PB82-128489 PC **A03**/MF **A01**
Washington Univ., Seattle.
Evergreen Point Bridge Maintenance Problems, 1980.
Final research rept. 1975-80,
C. B. Brown. Sep 80, 45p WA-RD-44.1
Prepared in cooperation with Federal Highway Administration, Washington, DC.

The 1974-79 study of the maintenance problems of the drawspan mechanism of the Evergreen Point Bridge across Lake Washington is reported. The approach was to predict the life of elements by Miner's hypothesis. For this the strains at critical points and the wind vector were measured over two sessions. These results were correlated with long term wind data to provide the number of cycles in a year at various stress levels. The fatigue capacity of anchor rods was determined by the Prot test on six specimens. The resulting

S-N curve was compared to the field measurements to determine the expected life of the rods from the Miner criterion. The methods developed provide useable maintenance procedures for the prevention of fatigue failure of critical structural elements.

PB82-128505 PC **A03**/MF **A01**
Washington Univ., Seattle.
Evergreen Point Bridge Maintenance Problems, 1977.
Annual research rept. no. 3,
C. B. Brown. Aug 77, 48p WA-RD-44.4
Prepared in cooperation with Federal Highway Administration, Washington, DC.

This report reflects a year of calms with little addition to the data base. Pressure transducers were placed and an analytical scheme is reported. This scheme was subsequently used in the final work.

PB82-128711 PC **A03**/MF **A01**
Tennessee Valley Authority, Knoxville. Office of Economic and Community Development.
Floods on Big Creek in the Vicinity of La Follette, Tennessee.
Flood rept.
Sep 81, 38p TVA/OECD/CD-81/23

This study pertains to flooding along Big Creek, the only stream having an identified flood hazard potential, which presents a major threat to life and property within the city limits. The information and technical data contained herein provide the basis for the development of revised flood damage prevention regulations and for future considerations of other floodplain management measures.

PB82-130501 PC **A05**/MF **A01**
Transportation Systems Center, Cambridge, MA.
Methods for Allocating Highway Costs.
Staff study (Final),
Douglass B. Lee. Apr 81, 86p SS-24-U3-181, FHWA/PL-81/017

Microeconomic theory and other concepts related to pricing are reviewed and applied to the problem of designing highway user charges. In view of the emphasis in the Congressional request for the Highway Cost Allocation Study on setting charges in accordance with costs occasioned, economic efficiency should be a major study goal. The goal of equity, whichever of its many meanings that term may have, remains an important consideration but not one which provides direct guidance for user charges. In regard to highway transportation, efficiency and equity do not appear to conflict in any significant ways. Efficient user charges are based on variable costs, primarily pavement damage, vehicle interference, and negative external costs.

PB82-130808 PC **A06**/MF **A01**
Florida Game and Fresh Water Fish Commission, Vero Beach.
An Assessment of Wetland Habitat Establishment at a Central Florida Phosphate Mine Site.
Final rept.,
Terry Gilbert, Tim King, and Brian Barnett. Sep 81, 112p FWS/OBS-81/45
Contract DI-14-16-0004-78-907
Prepared in cooperation with International Minerals and Chemical Corp., Bartow, FL.

Intensive strip mining operations used to recover the phosphate ore have had a significant effect on the ecology of central Florida. Approximately 6,500 acres of land are mined each year resulting in the total onsite disruption of existing soils, topography, drainage features, plant communities, and wildlife populations. Of the various habitats lost to mining, none are more critically important to wildlife than wetlands. This study investigated methods of establishing suitable habitat for wetland wildlife on phosphate mined lands.

PB82-130816 PC **A05**/MF **A01**
Urban Wildlife Research Center, Inc., Columbia, MD.
Coal Surface Mining Reclamation and Fish and Wildlife Relationships in the Easten United States. Volume I: Past Findings, the Surface Mining Law of 1977 (P.L. 95-87), Planning and Management Considerations, and Information Sources.
Final rept.,
Daniel L. Leedy. Jan 81, 93p FWS/OBS-80/24
Contract DI-14-16-0009-78-060
See also Volume 2, PB82-130824.

Part 1 of this 2-volume manual provides general information on the extent and nature of surface mining in the East, the amount of reclamation that has been accomplished, postmining land use alternatives, and environmental effects of surface mining in the past. The report covers much of the information available on fish and wildlife responses to habitat alterations caused by mining and reclamation. Information is presented concerning the capabilities to support fish and wildlife of mine spoils and land forms resulting from mining.

PB82-130824 PC **A09**/MF **A01**
Urban Wildlife Research Center, Inc., Columbia, MD.
Coal Surface Mining Reclamation and Fish and Wildlife Relationships in the Eastern United States. Volume II: Opportunities and Approaches for Fish and Wildlife Planning and Management in Coal Surface Mining, Reclamation and Postmining Land Uses.
Final rept.,
Daniel L. Leedy, and Thomas M. Franklin. Jan 81, 187p FWS/OBS-80/25
Contract DI-14-16-0009-78-060
See also Volume 1, PB82-130816.

Volume II of this two-volume reference manual is intended primarily for use by reclamation planners and managers as a general reference document. It identifies some of the opportunities for fish and wildlife planning and management in connection with various methods of surface mining for coal and the reclamation and management of surface-mined lands. It suggests approaches for management to enhance fish and wildlife in differenct regions and under different conditions, using real-life or hypothetical case examples. It further illustrates what productive habitat for various kinds of wild animal communities looks like at different stages of development.

PB82-131301 PC **A13**/MF **A01**
Bureau of Land Management, New Orleans, LA. New Orleans Outer Continental Shelf Office.
Regional Pipeline Environmental Assessment Record: An Aggregate Analysis of Major Areas of Pipeline Concern and Impact on the Outer Continental Shelf (Gulf of Mexico).
Mar 81, 298p BLM-YM-P/T-81-012-1792

Oil and gas pipeline activities on the Gulf of Mexico Outer Continental Shelf (OCS) affect a wide range of living and nonliving environmental variables (i.e., water, biologically sensitive areas, and food-web relations). These industrial activities have been increasing steadily over the past 20 years. Much of the information included herein pertains to a description of the existing environment for offshore Louisiana and Texas and an analysis of potential pipeline proposals and alternatives. The document is not as complete as an environmental impact statement (EIS) but it is sufficient in scope to consider the analysis of impacts of the majority of pipeline activities occurring in the northern and western Gulf of Mexico OCS. This report will be useful in evaluating pipeline impacts on the regional environment in the future. Rather than treating each pipeline application extensively, the information included herein will be referenced, thereby reducing the paperwork involved in environmental analysis.

PB82-131426 PC **A23**/MF **A01**
University of Southern Mississippi, Hattiesburg.
Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume I,
Ralph D. Cross, and Donald L. Williams. Oct 81, 543p FWS/OBS-81/04-VOL-1
Contract DI-14-16-0009-80-90
See also Volume 2, PB82-131434. Proceedings of a symposium held at San Antonio, Texas on September 9-11, 1980.

The Proceedings include 76 scientific and management papers on the institutional and management problems of providing freshwater inflow to estuaries, documented ecological effects in estuaries of modifying freshwater inflow, and suggested measures to bring freshwater inflow into water planning. The problems of freshwater inflow include reduction in volume due to inland water diversions, modification of seasonal flow regimes, reduction in water quality and alteration of sediment and nutrient content. Freshwater inflow problems were identified in Raritan Bay, Chesapeake Bay, southern Florida, the Gulf of Mexico, San Francisco Bay, and the Columbia River estuary.

PB82-131434 PC **A23**/MF **A01**
University of Southern Mississippi, Hattiesburg.
Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume II,
Ralph D. Cross, and Donald L. Williams. Oct 81, 542p FWS/OBS-81/04-VOL-2
Contract DI-14-16-0009-80-90
See also Volume 1, PB82-131426. Proceedings of a symposium held at San Antonio, Texas on September 9-11, 1980.

The Proceedings include 76 scientific and management papers on the institutional and management problems of providing freshwater inflow to estuaries, documented ecological effects in estuaries of modifying freshwater inflow, and suggested measures to bring freshwater inflow into water planning. The problems of freshwater inflow include reduction in volume due to inland water diversions, modification of seasonal flow regimes, reduction in water quality and alteration of sediment and nutrient content. Freshwater inflow problems were identified in Raritan Bay, Chesapeake Bay, southern Florida, the Gulf of Mexico, San Francisco Bay, and the Columbia River estuary.

PB82-131483 PC **A04**/MF **A01**
Geological Survey, Lakewood, CO. Water Resources Div.
Simulated Interactions between the Proposed Narrows Reservoir and the Water-Table Aquifer Along the South Platte River, Morgan County, Colorado.
Water-resources investigations (Final),
Alan W. Burns. 1981, 68p USGS/WRD/WRI-81-095, USGS/WRI-80-119
Prepared in cooperation with Water and Power Resources Service, Lower Missouri Region.

A computer model, including a ground-water-flow component and a mass-balance reservoir-operations component, was developed to simulate the proposed Narrows Reservoir and the adjacent alluvial aquifer of the South Platte River, Morgan County, Colorado. This model, using a weekly time step, simulated the transient interactions of these two systems for an initial-fill condition, a general-operational condition, and a sensitivity analysis to test the effects of possible data-input errors. The initial-fill simulation indicated that to fill the reservoir when hydraulic connection between the surface-water system and the aquifer is simulated would take 2 additional years if no connection were assumed. Parameters tested for sensitivity, in order of decreasing sensitivity, were: Transmissivity, specific yield, hydraulic connection between reservoir and aquifer, local recharge, boundary conditions, and dam permeability.

PB82-131541 PC **A03**/MF **A01**
Madison Port Authority, IN.
Riverport and Transportation Plan for the City of Madison Port Authority, Madison, Indiana. Final Preliminary Plan (Revised).
Oct 81, 45p EDA-81-0129
Grant EDA-06-06-01668-40
Prepared in cooperation with M W, Inc., Indianapolis, IN.

The Plan has the following objectives: Develop facilities to assure continued use of rail and generate increased shipment, by railroad, of commodities into and out of Madison; Development and location of all river port facilities within the designated zoned riverfront industrial area which would be under the control of the Port Authority; and Develop an industrial park on the hilltop to compliment the intermodal transportation system.

PB82-131657 PC **A12**/MF **A01**
Mississippi State Highway Dept., Jackson. Research and Development Div.
Wave Forces on Causeway-Type Coastal Bridges: Effects of Angle of Wave Incidence and Cross-Section Shape.
Final rept. 1 Oct 78-30 Sep 80,
Keith H. Denson. Dec 80, 256p MSHD-RD-80-070, FHWA/MS-80/070
Prepared in cooperation with Mississippi State Univ., Mississippi State.

Wave forces and moments were obtained for two different coastal bridge types as functions of wave height, water depth and angle of water incidence. 1:24 scale models of both bridges were used to determine forces and moments. One bridge model was a slab and beam type carrying four lanes of traffic along two structurally separated pairs of bridges adjacent to one another and with a common pile bent foundation. This

model was of the Bay St. Louis, Mississippi bridge on U.S. Highway 90 which was heavily damaged by Hurricane Camille in 1969. The other bridge model was a trapezoidal box girder with 1:10 superelevation to seaward. Results are presented in the form of dimensionless design graphs which are suitable for use on any other geometrically similar bridges.

PB82-131673 PC **A04**/MF **A01**
Sperry Systems Management, Great Neck, NY.
Traffic Diversion Software Applications Summary.
Final rept.,
R. A. Reiss. Sep 81, 61p GF-3708-1067, FHWA/RD-80/100
Contract DOT-FH-11-9557

The report summarizes potential applications for a software package which optimizes traffic flow in a roadway corridor. Two versions of the package are described. The on-line version (DIVERT) contains an algorithm which optimizes a performance objective in the corridor. This version is intended for integration into a real-time corridor traffic control system. The off-line version (DIVSIM) contains DIVERT embedded in the traffic simulation program, SCOT. This version enables the user to exercise the algorithm via simulation in a specific corridor.

PB82-131699 PC **A03**/MF **A01**
National Transportation Safety Board, Washington, DC. Office of Evaluations and Safety Objectives.
Safety Effectiveness Evaluation: Federal Highway Administration Non-Interstate Resurfacing, Restoration, and Rehabilitation Program.
22 Sep 81, 50p NTSB-SEE-81-4

The report analyzes the activities of the Federal Highway Administration (FHWA) to implement a national program for preserving and improving the non-interstate, Federal-aid Highway System through the use of Federal funds for RRR work. The report reviews the overall nature of the Federal-aid Highway Program; briefly describes the characteristics of the Federal-aid Highway System; and describes the general findings of the 'Report of the Secretary of Transportation to the Congress on the State of the Nation's Highways: Conditions and Performance (January 1981)'. Finally, the report closely reviews and analyzes the three major rulemaking notices issued by the FHWA on the RRR program since 1976, including the 'cost/benefit analysis' published by the FHWA in support of the rulemaking effort. The Board found that the FHWA has not developed a coherent program for RRR work based on reliable research that would provide a basis to measure the program's safety and durability impacts. The Board concluded that the 5-year rulemaking record is contradictory, unsupported by fact, and seriously misleading. The report is critical of the FHWA's argument that use of lower standards can provide 'greater systemwide safety' than higher standards because more miles of roads can be improved. The cost/benefit study does not support that claim.

PB82-131970 PC **A05**/MF **A01**
Transportation Research Board, Washington, DC.
Collection and Use of Pavement Condition Data.
Final rept.
Jul 81, 83p TRB/NCHRP/SYN-76, ISBN-0-309-03161-3
Sponsored in part by American Association of State Highway and Transportation Officials, Washington, DC., and Federal Highway Administration, Washington, DC. Library of Congress catalog card no. 81-52689. Also pub. as ISSN-0547-5570. Report on National Cooperative Highway Research Program, Synthesis of Highway Practice.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

This synthesis will be of special interest and usefulness to highway designers, researchers, and others concerned with pavement management. The report reviews current practices of collecting pavement condition data for use in making decisions on maintenance, rehabilitation, and reconstruction. To develop this synthesis in a comprehensive manner and to ensure inclusion of significant knowledge, the Board analyzed available information assembled from numerous sources, including a large number of state highway and transportation departments. A topic panel of experts in the subject area was established to guide the researcher in organizing and evaluating the collected data, and to review the final synthesis report.

PB82-132432 PC **A02**/MF **A01**
TRW Energy Systems Group, Redondo Beach, CA.
Effects of Synfuel Use.
Journal article,
Masood Ghassemi, Rajan Iyer, Robert Scofield, and Joe McSorley. Nov 81, 10p EPA-600/J-81-481
Pub. in Environmental Science and Technology, v15 n8 p866-873 Aug 81.

This paper reviews environmental concerns relating to the distribution, handling, and end use of synfuel products likely to enter the marketplace by the year 2000, and assigns priority rankings to the products based on environmental concerns to aid EPA to focus its regulatory and research activities. Major products and by-products from oil shale, coal liquefaction, and coal gasification technologies are considered. Results indicate that: (1) significant quantities of synfuel products are expected to enter the marketplace during the next 20 years; (2) large-scale transportation, distribution, and end use of certain synfuel products can present significant threats to the environment and the public health; (3) based on gross characteristics, synfuel products appear to be similar to petroleum products, but detailed characterization data are not available with which to judge their relative safety; and (4) synfuel test and evaluation programs currently underway or planned provide excellent opportunities for collecting some of the required environmental data. Three likely scenarios for shale- and coal-based synfuel plant buildup are projected. The type and quantity of synfuel products and by-products likely to enter the market are identified and their regional market penetration is estimated. The environmental analysis consists of a review of available data on the physical, chemical, and health effects characteristics of synfuel products and environmental significance of their characteristics.

PB82-132473 PC **A02**/MF **A01**
Minnesota Univ., Minneapolis.
Aerosol Sampling Inlets and Inhalable Particles.
Journal article,
Benjamin Y. H. Liu, and David Y. H. Pui. 19 Jun 80, 14p EPA-600/J-81-026
Grant EPA-R-804600
Pub. in Atmospheric Environment, v15 p589-600 1981.

The problem of sampling aerosols from the ambient atmosphere has been considered from a theoretical point of view. Following a review of the various samplers and inlets used in ambient sampling, the factors contributing to high sampling efficiency for large particles are discussed. It is pointed out that the major mechanisms for particle loss in sampling inlets are impaction on external surfaces and impaction, turbulent deposition, and sedimentation on internal surfaces. Therefore, an efficient inlet is one for which these losses are minimized. Based on these theoretical considerations, a new inlet for sampling inhalable particles (particles with aerodynamic diameter of 15 micrometers or less) has been designed, constructed, and tested. The inlet incorporates an inlet configuration allowing for the efficient entry of large particles into the inlet opening, followed by an impactor to remove the coarse, non-inhalable particles. The inlet has been found to have essentially wind speed independent characteristics for wind speeds of up to 9 km/hr, the maximum wind speed used in the tests. The impactor has also been found to have sharp cut-off characteristics with a sharpness of cut parameter, sigma g, of 1.18. It is believed that this particular inlet will meet the requirements of a high efficiency inlet for sampling inhalable particles from the ambient atmosphere.

PB82-132572 PC **A02**/MF **A01**
Municipal Environmental Research Lab., Cincinnati, OH.
Removing Trihalomethanes from Drinking Water - An Overview of Treatment Techniques.
Journal article,
James M. Symons, Alan A. Stevens, Robert M. Clark, Edwin E. Geldreich, and O. Thomas Love, Jr. 1981, 12p EPA-600/J-80-360
Pub. in Water/Engineering and Management, 128, p50, 52, 53, 56, 61-64 Jul 81.

In 1974 trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform) were discovered to be formed during the disinfection step of drinking water if free chlorine was the disinfectant. This, coupled with the perceived hazard to the consumer's health, led the U.S. Environmental Protection Agency to amend the National Interim Primary Drinking Water Regulations to include a maximum contaminant level of 0.10 mg/L tor total trihalomethanes. For trihalomethane removal, aeration - either by diffused-air or with towers - and adsorption - either by powdered activated carbon or granular activated carbon - is effective. The major disadvantage of this approach is that trihalomethane precursors are not removed by aeration. For trihalomethane precursor control, effective processes are: (1) oxidation by ozone or chlorine dioxide; (2) clarification by coagulation, settling and filtration, precipitative softening, or direct filtration; or (3) adsorption by powdered activated carbon or granular activated carbon. In addition, some modest removal or destruction of trihalomethane precursors can be achieved by oxidation with potassium permanganate lowering the pH, or moving the point of chlorination to the clarified water. Lowering of trihalomethane precursor concentrations has the additional advantage of reducing overall disinfectant demand, thereby reducing the possibility of the formation of all disinfection byproducts. Neither chlorine dioxide, nor ozone, nor chloramines produce trihalomethanes at significant concentrations when used alone as disinfectants. Furthermore, the cost of any of these unit processes is very low. The major disadvantage of using alternate disinfectants for trihalomethane control relates to the lack of any precursor removal.

PB82-132580 Not available NTIS
Minnesota Univ., Minneapolis.
Aerosol Formation in Urban Plumes.
Journal article,
Kenneth T. Whitby. c1980, 21p EPA-600/J-80-358
Grant EPA-R-803851
Pub. in Annals of the New York Academy of Sciences, v338 p258-275, 15 May 80.

One of the most important questions of the day is exactly how to measure the contribution of identifiable sources to the increasing haze that now covers a good part of the eastern United States in summer. This concern has resulted in a number of large studies of point sources, such as power plants. However, the multitude of small sources in every urban area also combine to form an urban plume that not only contributes to the pollution in the downwind areas immediately under it, but also to the general haze after the plume has lost its identity. Furthermore, the author has only a sketchy idea of what such plumes contribute to the general haze on the days after they have lost their identity. Although it is well known that secondary aerosol mass and O3 are formed in the urban plume, quantitative relationships between primary precursors and secondary products are scarce.

PB82-132770 PC **A15**/MF **A01**
National Bureau of Standards, Washington, DC.
Environmental Speciation and Monitoring Needs for Trace Metal-Containing Substances from Energy-Related Processes: Proceedings of the DOE/NBS Workshop Held at the National Bureau of Standards in Gaithersburg, Maryland on May 18-20, 1981.
Final rept.,
Frederick E. Brinckman, and Richard H. Fish. Nov 81, 339p NBS-SP-618
Sponsored in part by Department of Energy, Washington, DC. Office of Health and Environmental Research. Library of Congress catalog card no. 81-600140.

This book presents the Proceedings of the DoE/NBS Workshop on Environmental Speciation and Monitoring Needs for Trace Metal-Containing Substances from Energy Related Processes held at the National Bureau of Standards , Gaithersburg, MD, on May 18-20, 1981. The Workshop was sponsored by the Office of Health and Environmental Research, DoE, and the Office of Recycled Materials, NBS. The volume contains refereed papers submitted by 24 invited speakers, along with substantially complete text of the discussion following the papers, edited by the Co-chairpersons. The Proceedings address three major topic areas forming the overall objective of the Workshop: (1) What are the general and specific types of metal- or metalloid-containing substances occurring in energy-related process materials such as coals, oil shales, and waste products. (2) What are the current status and future prospects of element- and compound-specific measurement methods suitable for speciation of trace (ppm, ppb) metal- and metalloid-containing substances transmitted to the environment by energy-processing or waste cycling technologies. (3) For what toxic molecular forms of speciated process effluents should biological dose-response data be generated to assure reliable environmental impact and monitoring measurements. Main questions focused on providing

assurance that the speciation methods (or their development) fit basic bioassay criteria along with appropriate standard reference materials for meeting quantitative process and waste monitoring or control needs.

PB82-132812 PC **A02**/MF **A01**
Maine Dept. of Transportation, Bangor. Materials and Research Div.
Alternative Sign Sequences for Work Zones on Rural Highways. Executive Summary.
Final rept. Apr 77-Aug 80,
Richard W. Lyles. May 81, 19p FHWA/RD-80/162
Contract DOT-FH-11-9401
Prepared in cooperation with Mane Univ. at Orono. Social Science Research Inst. See also PB82-132820.

The report summarizes the results of two experiments, sponsored by the FHWA and carried out at the Maine Facility, which examined the effectiveness of several alternative sign sequences for warning motorists on a two-lane rural road that there are construction/maintenance activities ahead which require closure of one lane. Types of signs tested include typical MUTCD warning signs, flasher augmented signs, and symbol signs. Principal findings concluded that flasher augmented signs were most effective in slowing approaching motorists and symbol signs were always at least as effective as the typical warning signs with word messages.

PB82-133604 PC **A12**/MF **A01**
SRI International, Menlo Park, CA.
Analyses, Experimental Studies, and Evaluations of Control Measures for Air Flow and Air Quality on and Near Highways. Volume I: Experimental Studies, Analyses, and Model Development.
Final rept. 1973-80,
Walter F. Dabberdt, Eugene Shelar, David Marimont, and George Skinner. Mar 81, 273p FHWA/RD-81/051
Contract DOT-FH-11-8125
See also Executive Summary, PB82-133596, and Volume 2, PB82-133612. Errata sheet inserted.
Also available in set of 4 reports PC E18, PB82-133588.

Experimental and theoretical investigations have been made of meteorological and air quality conditions near a broad range of complex roadway configurations. These are described, and some new insights into the interrelationships among traffic, meteorology, and configuration are discussed. The development of a new and versatile dispersion model, called ROADMAP, is also described together with an evaluation of the model's performance relative to measured atmospheric and wind tunnel pollutant concentration data. The experimental data indicates a significant effect of waste heat on near-roadway dispersion. The combined effects of traffic movement and waste heat emissions cause increases in the turbulence intensity of up to 200% across the roadway. However, there is apparently little effect on turbulence caused by changes in traffic volume or speed (for the moderate-to-heavy traffic conditions present during the tests). An aerodynamic or shelter effect is postulated to exist and to be a significant influence for grade-level roads.

PB82-133802 PC **A06**/MF **A01**
Agency for International Development, Washington, DC.
Jamaica Feeder Roads: An Evaluation.
Project impact evaluation rept. no. 11,
Robert J. Berg, Carleen Gardner, Michael M. Horowitz, Palmer Stearns, and Charles Vandervoort. Nov 80, 103p AID-PN-AAJ-199
Prepared in cooperation with State Univ. of New York at Binghamton, and Department of Transportation, Washington, DC.

Although it upgraded a total of 181 miles of rural roads between 1972 and 1976, the Jamaican feeder roads project failed to have any demonstrably significant benefits. This report investigates the causes of that failure by examining the logic, appropriateness, and achievement of the project's goals. The authors conclude that the haste brought about by the project's high political priority ultimately caused its failure. A more methodical design and review process would have revealed the ineffectiveness of the rural roads approach and its propensity for failure. These conclusions are particularly important since politically-oriented foreign assistance from any source could encourage repetition of similar difficulties.

PB82-133828 PC **A08**/MF **A01**
Bureau of Mines, Washington, DC.
Materials Recycling: An Overview of the Mineral Waste Utilization Symposium (6th).
Information circular,
S. A. Bortz, and K. B. Higbie. Sep 80, 165p
BUMINES-IC-8826

This Bureau of Mines report reviews the information presented at the Sixth Mineral Waste Utilization Symposium cosponsored by the Bureau of Mines, U.S. Department of the Interior, and the ITT Research Institute. Environmental scientists and engineers from nine countries participated in the symposium, which was held May 2-3, 1978, at the Chicago campus of ITT Research Institute. The 56 papers presented on the reclamation and recycling of mining and mineral wastes, municipal solid waste, industrial wastes, and scrap metal are summarized herein.

PB82-134008 Not available NTIS
National Bureau of Standards, Washington, DC.
Goal: Better Standards for Pipeline Welds.
Final rept.,
R. P. Reed. Sep 81, 4p
Pub. in Weld. Des. Fabr. 54, n8 p68-71 Sep 81.

The NBS program to assist the Department of Transportation in establishing fitness-for-service alternative allowable flaw size standards is reviewed. The application of fracture mechanics technology to fitness-for-service standards is discussed. Past research is reviewed. NBS programs on fracture mechanics and non-destructive testing with respect to the Alaska Natural Gas Transportation System are presented.

PB82-134040 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Procurement, Logistics, and Readiness Div.
DOD Can Increase Revenues Through Better Use of Natural Resources It Holds in Trust.
25 Nov 81, 41p PLRD-82-9

The Department of Defense manages almost 25 million acres of land throughout the United States and its possessions. DOD policy requires all military bases to manage these lands, encompassing vast natural resources, under the multiple-use principle, consistent with the military mission. Multiple uses include forestry, agricultural leasing, fish and wildlife programs, and recreation. This report discusses how DOD can improve its natural resources program and achieve additional revenues of over $3 million annually.

PB82-134107 PC **A02**/MF **A01**
Southern Research Inst., Birmingham, AL.
Improvement of Hot-Side Precipitator Performance with Sodium Conditioning--An Interim Report.
Journal article,
J. P. Gooch, R. E. Bickelhaupt, G. H. Marchant, Jr, R. D. McRanie, and L. E. Sparks. Mar 81, 9p EPA-600/J-81-482
Pub. in Air Pollution Control Association Jnl, v31 n3 Mar 81. Prepared in cooperation with Electric Power Research Inst., Palo Alto, CA.

The article reports on a research project (sponsored by EPA, EPRI, and Southern Company Services) to evaluate sodium conditioning as a possible solution to performance deficiency problems encountered at a number of major utility plants during the development of an unexpected, time-dependent degradation of performance of hot-side electrostatic precipitators (ESPs) collecting ash from certain coals (usually low-sodium low-sulfur coals). The article concludes that sodium conditioning produced by sodium sulfate addition to the coal supply is an effective way to improve the performance of a hot-side ESP which has undergone the sodium-depletion high-resistivity pattern of performance deterioration. Although the reported results are believed to be of general significance, certain characteristics of the operating parameters at Gulf Power Co.'s Lansing Smith plant are noteworthy with regard to the success of the conditioning process. First, ash concentration and composition, and boiler design, allowed the addition of the required amount of sodium without creating boiler operating problems. Secondly, the calcium content of the coal was moderate, and there is some evidence that high calcium concentrations would require more sodium addition for the same degree of resistivity reduction. Applicability of the process for other ash chemistries and operating conditions remains to be determined.

PB82-134115 PC **A11**/MF **A01**
SCS Engineers, Covington, KY.
Survey of On-Going and Completed Remedial Action Projects.
Final rept. Apr-Oct 80,
N. Neely, D. Gillespie, F. Schauf, and J. Walsh. Sep 81, 242p EPA-600/2-81-246
Contract EPA-68-01-4885
Color illustrations reproduced in black and white.

During the summer of 1980, a nationwide survey was conducted to determine the status of remedial actions applied at uncontrolled hazardous waste disposal sites. Over 130 individuals were contacted to obtain information on such remedial action projects. A total of 169 sites were subsequently identified as having been subject to corrective action. Remedial actions were found to have been implemented at many kinds of hazardous waste disposal facilities including drum storage areas, incinerators, and injection wells, but most frequently landfill/dumps and surface impoundments. At the sites receiving such remedial actions, ground water was found to be the most commonly affected media, followed closely by surface water. Although several types of remedial measures were identified, remedial activities usually consisted of containment and/or removal of the hazardous waste. Sufficient money was often not available for complete environmental cleanup (e.g., extraction and treatment). The survey determined that a lack of sufficient funds and/or selection of improper technologies was responsible for remedial actions having been applied effectively at only a portion of the uncontrolled hazardous waste disposal sites. Nine sites were studied in detail to document typical pollution problems and remedial actions at uncontrolled hazardous waste disposal sites.

PB82-134404 PC **A02**/MF **A01**
Washington Univ., Seattle. Dept. of Atmospheric Sciences.
Scavenging of Aerosol Particles by Precipitation.
Journal article,
Lawrence F. Radke, Peter V. Hobbs, and Mark W. Eltgroth. 23 Mar 80, 10p CONTRIB-534, EPA-600/J-80-355
Grant EPA-R-805203
Pub. in Jnl. of Applied Meteorology, v19 n6 p715-722 Jun 80.

Airborne measurements have been made of aerosol particle size distributions (>0.01 micrometer) in aged air masses, in the plumes from several coal power plants and a large Kraft paper mill, and in the emissions from a volcano, before and after rain or snow showers. These measurements have been used to deduce the precipitation scavenging collection efficiencies of aerosol particles ranging in size from approximately equal to 0.01 to 10 micrometers diameter. Despite large variations in the nature of the aerosol particles and the precipitation, the scavenging collection efficiencies as a function of particle size showed marked similarities, with some well-defined maxima and minima values. The measurements agree well with theoretical calculations for aerosol particles use than 1 micrometer, but for the submicron aerosol particles the scavenging collection efficiencies are generally much higher, and the region of very low scavenging efficiencies (the 'scavenging gap') much narrower, than current theories predict. Some possible explanations for these discrepancies are suggested.

PB82-134628 PC **A09**/MF **A01**
Cambridge Univ. (England). Dept. of Engineering.
A Review of Numerical Methods for the Analysis and Design of Soft Ground Tunnels.
M. J. Gunn. 1981, 181p CUED/D-SOILS/TR-114-1981
Sponsored in part by Transport and Road Research Lab., Crowthorne (England). Also pub. as ISSN-0309-7439.

The last two decades have witnessed a steady fall in the cost of digital computers and also an increase in computing power (both speed and storage) of the machines available. A parallel development has taken place in the application of numerical methods (using those same computers) to all branches of engineering. The scope of this review is the degree of success that can be expected when various numerical methods are applied to problems associated with soft ground tunnelling. The view taken here of what constitutes a numerical method is rather wider than the view likely to be taken by a numerical analyst or computer scientist. For the purposes of this review any method of analysis

which is made more convenient by the use of a digital computer is a numerical method. Thus the review discusses some methods which are analytical rather than numerical. The first reason for this is (as has just been suggested) a computer would be used to tabulate numerical results from some analytical solution (e.g. obtained via the theory of elasticity). The second reason is related to a particular view of numerical modelling: the results of such analysis should lead to a simpler view of the problem. Although a numerical model may contain an elaborate set of assumptions the engineer should examine the results to determine the dominant physical processes and hopefully a simpler (analytical) model of the situation.

PB82-135302 PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Kielder Aqueduct Tunnels - Predicted and Actual Geology,
T. P. Davies, P. G. Carter, D. A. C. Mills, and G. West. c1981, 48p TRRL-SUPPLEMENTARY-676
Also pub. as ISSN-0305-1315.

The Kielder tunnels are part of the Northumbrian Water Authority's Kielder Water Scheme and constitute the major element of an aqueduct linking the rivers Tyne, Wear and Tees. The 32 km length of hard rock tunnel traverses a varied sequence of sedimentary Carboniferous strata with limited occurrences of intrusive igneous rocks. Full-face tunnel boring machines were used for most of the tunnel length, with shorter sections being driven using drill-and-blast methods and a roadheader. The report describes the site investigations undertaken and how the information gained was used to assess the suitability of alternative excavation and support methods. Conditions encountered during construction are compared with predictions derived from site investigations; discrepancies are discussed and means whereby these might have been reduced are considered with the intention of facilitating good future site investigation practice. (Copyright (c) Crown Copyright 1981.)

PB82-135310 PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Determining Optimum Routes from Maps,
N. B. Taylor, and D. J. Jeffery. c1981, 39p TRRL-LR-1001
Also pub. as ISSN-0305-1293.

A simple method for estimating journey times and costs directly from maps is described together with the results of a validation experiment involving travel over all types and classes of urban and rural roads both in and out of peak hours. The results are used in conjunction with a computer simulation of a road network, involving 2,300 km of classified and unclassified roads in and around the county of Berkshire, to show that the method can be used to select minimum cost routes, and that the selected routes will not differ from the true optimum by more than about 0.2 percent averaged over all trips, regardless of journey length. Formula are obtained which relate the inaccuracy, or excess, of optimum routes selected by the model to the magnitude of error in time or cost estimates on individual road sections, and the effect of junction delays is quantitatively discussed. It is shown that the model should be applicable, without calibration or modification, for all areas of the country. (Copyright (c) Crown Copyright 1981.)

PB82-135336 PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Site Investigation and Construction of the Cardiff Cable Tunnel,
G. West, and D. McLaren. c1981, 29p TRRL-LR-1012
Also pub. as ISSN-0305-1293.

The site investigation and construction records for the 1.5 km long Cardiff cable tunnel have been examined to see whether they can give lessons of good practice for tunnel site investigation. The tunnels were constructed wholly within the Keuper Marl; excavation was mainly by full-face tunnelling machine and lining was with pre-cast concrete bolted segments. The report describes the site investigation and construction of the works in some detail with special emphasis on ground conditions. On this site preliminary information proved most useful. The site investigation gave a generally satisfactory account of the site geology. However, points to emerge from the study were that if mechanized tunnel excavation is a possibility and the ground is predominately soft, then bands of harder material at tunnel depth take on extra significance and must be carefully recorded and tested. Rock strength test results in the site investigation report should be carefully considered when making a choice of method. If the operating conditions call for a watertight tunnel close attention should be given to permeability results in the site investigation report which show the possibility of high ground water flows. (Copyright (c) Crown Copyright 1981.)

PB82-135559 PC **A05**/MF **A01**
National Research Council, Washington, DC. Water Resources Research Review Committee.
Federal Water Resources Research: A Review of the Proposed Five-Year Program Plan.
1981, 92p W82-01051, OWRT-C-00086-G-0426(1)
Contract DI-14-34-0001-0426

The Water Resources Research Review Committee studied the 1975 assessment of the nation's water resources by the U.S. Water Resources Council and other recent reports that highlight pressing water problems. The Committee then developed criteria by which to determine the research areas of highest priority. Using these criteria, the Committee identified thirty-one research areas where emphasis should be placed in programming water resources research over the next five years. The thirty-one research areas are described in relation to the professional disciplines in the report.

PB82-135799 PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
The Minibuses and the Public Transport System of Kuala Lumpur,
Jamison Mackay. c1981, 35p TRRL-SUPPLEMENTARY-678
Also pub. as ISSN-0305-1315.

This report is one of a series of studies undertaken by the TRRL, examining public transport in developing countries, and describes the minibus system of Kuala Lumpur, Malaysia's capital and largest city. In 1975 a fleet of minibuses was introduced into the city, operating in competition with the existing stage buses. The operation and service of the minibus system is examined to determine why it has been so successful in attracting passengers away from the conventional stage bus system. While the stage bus is more efficient per unit of capacity, various institutional factors have made the minibus more successful. (Copyright (c) Crown Copyright 1981.)

PB82-135872 PC **A04**/MF **A01**
New York State Dept. of Transportation, Albany. Engineering Research and Development Bureau.
Development of a Test Trailer for High-Volume Skid-Resistance Surveys.
Final rept.,
M. W. Fitzpatrick. Dec 77, 63p FHWA/NY-77-RR45

A skid trailer system was successfully designed, built, and tested to conform with ASTM Designation E274-70. (It also meets the newly adopted ASTM Designation E274-77.) It is now performing its intended function of routinely surveying the statewide highway system. This report describes the design philosophy and evaluation of the system after its construction. The design is concluded to be sound, but some changes should be included by anyone wishing to copy it. Appended are the specifications used to obtain the truck and baffled water tank, and a descriptive list of all the trailer's structural parts. Detail drawings are not included, but are available on request.

PB82-135914 PC **A06**/MF **A01**
Federal Highway Administration, Washington, DC. Materials Div.
Epoxy Thermoplastic Pavement Marking Material: Specification and Testing.
Interim rept. Dec 78-Jul 80,
Brian H. Chollar, and Bernard R. Appleman. Sep 80, 109p FHWA/RD-80/069

This report presents the results of an extensive laboratory program to establish a specification for an epoxy thermoplastic (ETP) striping material which was developed in a contract research study for the Federal Highway Administration by Southwest Research Institute. The present study developed laboratory test procedures to evaluate the significant properties of the ETP material and its components. Properties studied included viscosity, reflectance, thermal stability, softening point, epoxy equivalent weight, and infrared spectrum. Also studied were the effects upon selected ETP properties of variations in the composition ratios of the ETP components and variations in the epoxy resin properties. From a statistical analysis of the results, upper and lower limits for the ETP physical properties were determined. An interim composition performance specification was then established for the procurement of this material based on epoxy resins manufactured by CIBA-GEIGY and various commercial pigments. Analytical procedures for determining titanium dioxide, lead chromate, glass bead, and organic contents were also incorporated into the specification.

PB82-136342 PC **A04**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Water Enforcement.
NPDES Compliance Monitoring Inspector Training: Overview.
Jun 81, 66p
See also PB81-136359.
Also available in set of 5 reports PC E19, PB82-136334.

This document is part of a set of five documents which make up the National Pollutant Discharge Elimination System (NPDES) Compliance Monitoring Training Program. The training modules were developed by the Environmental Protection Agency (EPA), Office of Water Enforcement and Permits (OWEP), to instruct NPDES inspectors in various aspects of conducting NPDES Compliance Monitoring Inspections. The report is an overview which examines compliance inspections.

PB82-136359 PC **A05**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Water Enforcement.
NPDES Compliance Monitoring Inspector Training: Legal Issues.
Jun 81, 97p
See also PB82-136342, and PB82-136367.Portions of this document are not fully legible.
Also available in set of 5 reports PC E19, PB82-136334.

This document is part of a set of five documents which make up the National Pollutant Discharge Elimination System (NPDES) Compliance Monitoring Training Program. The training modules were developed by the Environmental Protection Agency (EPA), Office of Water Enforcement and Permits (OWEP), to instruct NPDES inspectors in various aspects of conducting NPDES Compliance Monitoring Inspections. The training module describes the legal issues.

PB82-136367 PC **A05**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Water Enforcement.
NPDES Compliance Monitoring Inspector Training: Biomonitoring.
Jun 81, 97p
See also PB82-136359, and PB82-136375.Portions of this document are not fully legible.
Also available in set of 5 reports PC E19, PB82-136334.

This document is part of a set of five documents which make up the National Pollutant Discharge Elimination System (NPDES) Compliance Monitoring Training Program. The training modules were developed by the Environmental Protection Agency (EPA), Office of Water Enforcement and Permits (OWEP), to instruct NPDES inspectors in various aspects of conducting NPDES Compliance Monitoring Inspections. The training module describes biomonitoring procedures.

PB82-136375 PC **A04**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Water Enforcement.
NPDES Compliance Monitoring Inspector Training: Sampling Procedures.
Jun 81, 65p
See also PB82-136367, and PB82-136383.
Also available in set of 5 reports PC E19, PB82-136334.

This document is part of a set of five documents which make up the National Pollutant Discharge Elimination System (NPDES) Compliance Monitoring Training Program. The training modules were developed by the Environmental Protection Agency (EPA), Office of Water Enforcement and Permits (OWEP), to instruct NPDES

inspectors in various aspects of conducting NPDES Compliance Monitoring Inspections. The training module is on sampling procedures.

PB82-136383 PC **A08**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Water Enforcement.
NPDES Compliance Monitoring Inspector Training: Laboratory Analysis.
Jun 81, 166p
See also PB82-136375.
Also available in set of 5 reports PC E19, PB82-136334.

This document is part of a set of five documents which make up the National Pollutant Discharge Elimination System (NPDES) Compliance Monitoring Training Program. The training modules were developed by the Environmental Protection Agency (EPA), Office of Water Enforcement and Permits (OWEP), to instruct NPDES inspectors in various aspects of conducting NPDES Compliance Monitoring Inspections. The training module describes procedures for laboratory analysis.

PB82-136672 PC **A09**/MF **A01**
Resource International, Inc., Worthington, OH.
Flexible Pavement Overlay Design Procedures. Volume 1. Evaluation and Modification of the Design Methods.
Final rept. Sep 77-Nov 80,
Kamran Majidzadeh, and George J. Ilves. Aug 81, 184p FHWA/RD-81/032
Contract DOT-FH-11-9315
See also Volume 2, PB82-136680.

The objectives of this research report is to provide the pavement engineer with a rational and ready reference to design procedures for asphaltic concrete overlay of flexible pavements based on elastic layer theory. The design procedures and the analytical techniques presented have been formulated to predict the structural fatigue response of asphaltic concrete overlays for various design conditions, including geometrical and material properties, loading conditions and environmental variables.

PB82-136680 PC **A07**/MF **A01**
Resource International, Inc., Worthington, OH.
Flexible Pavement Overlay Design Procedures. Volume 2. User Manual.
Final rept. Sep 77-Nov 80,
Kamran Majidzadeh, and George Ilves. Aug 81, 127p FHWA/RD-81/033
Contract DOT-FH-11-9315
See also Volume 1, PB82-136672.

This user manual outlines a procedure for the design of asphaltic concrete overlays on existing asphaltic concrete pavement surfaces. It is intended as a guide to the user on the type and form of information required as input to the procedure and contains all elements necessary for the user to prepare designs for flexible pavement overlays.

PB82-136847 PC **A16**/MF **A01**
PEDCo-Environmental, Inc., Cincinnati, OH.
Dioxins.
Final rept.,
M. P. Esposito, T. O. Tiernan, and Forrest E. Dryden. Nov 80, 371p EPA-600/2-80-197
Contracts EPA-68-03-2577, EPA-68-03-2659
Sponsored in part by Contract EPA-68-03-2579. Prepared in cooperation with Wright State Univ., Dayton, OH., and Walk, Haydel and Associates, Inc., New Orleans, LA.

This report deals with a group of hazardous chemical compounds known as dioxins. The extreme toxicity of one of these chemicals, 2,3,7,8-tetrachlor-dioxin (2,3,7,8-TCDD), has been a concern of both scientific researchers and the public for many years. The sheer mass of published information that has resulted from this concern has created difficulties in assessing the overall scope of the dioxin problem. In this report, the voluminous data on 2,3,7,8-TCDD and other dioxins are summarized and assembled in a manner that allows comparison of related observations from many sources; thus, the report serves as a comprehensive guide in evaluation of the environmental hazards of dioxins. Sections 2 and 3 present detailed information on the chemistry and sources of dioxins. Various routes of formation of dioxins are discussed, and the possible presence of doxins in basic organic chemicals and pesticides is addressed. Section 4 details the development of an analytical method for detecting part-per-trillion levels of dioxins in industrial wastes. Sections 5 through 8 discuss routes of human exposure to dioxins, including accounts of public and occupational exposure, and the health effects, environmental degradation, transport, and disposal of dioxins.

PB82-137639 PC **A06**/MF **A01**
Raymond International Builders, Inc., Houston, TX.
Field Study of Pile Group Action. Appendix A.
Final rept.,
H. B. Ha, and M. W. O'Neill. Mar 81, 106p FHWA/RD-81/003
Contract DOT-FH-11-9526
See also Appendix B, PB82-137647.

This report is the final report for a study involving the static vertical load testing of a full scale, instrumented pile group. The test group consisted of nine pipe piles instrumented for settlement, load transfer, pore pressures, total pressures and inclination. Two similarly instrumented reference (control) piles were also installed. Two smaller subgroups within the main group were also tested, and uplift tests were conducted on several of the individual piles. The soils at the test site consisted of clays that were overconsolidated by desiccation. It was determined that the efficiency of the main group and of the subgroups was essentially unity. Settlement ratios in the working load range were found to vary from about 1.2 to about 1.7, depending on the number of piles that were loaded. Failure was observed to be by plunging of the individual piles. Unit side load transfer varied essentially linearly with depth. Some dependence of load transfer patterns on residual stresses that remained after driving the piles was observed. The measured behavior of the group and subgroups was modeled by the 'hybrid' algorithm, by means of Program PILGP1, which was developed for this study and documented in Appendices A and B.

PB82-137647 PC **A05**/MF **A01**
Raymond International Builders, Inc., Houston, TX.
Field Study of Pile Group Action. Appendix B.
Final rept.,
H. B. Ha, and M. W. O'Neill. Mar 81, 81p FHWA/RD-81/004
Contract DOT-FH-11-9526
See also Appendix A, PB82-137639.

This report is the final report for a study involving the static vertical load testing of a full scale, instrumented pile group. The test group consisted of nine pipe piles instrumented for settlement, load transfer, pore pressures, total pressures and inclination. Two similarly instrumented reference (control) piles were also installed. Two smaller subgroups within the main group were also tested, and uplift tests were conducted on several of the individual piles. The soils at the test site consisted of clays that were overconsolidated by desiccation. It was determined that the efficiency of the main group and of the subgroups was essentially unity. Settlement ratios in the working load range were found to vary from about 1.2 to about 1.7, depending on the number of piles that were loaded. Failure was observed to be by plunging of the individual piles. Unit side load transfer varied essentially linearly with depth. Some dependence of load transfer patterns on residual stresses that remained after driving the piles was observed. The measured behavior of the group and subgroups was modeled by the 'hybrid' algorithm, by means of Program PILGP1, which was developed for this study and documented in Appendices A and B. Good agreement between computed and measured results were achieved when the unit load transfer curves from the reference piles were used and when the soil modulus of deformation was appropriately adjusted to account for pile reinforcement of the soil and the presence of very small strains in the mass of soil around the group.

PB82-137761 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
User Charge Revenues for Wastewater Treatment Plants--Insufficient to Cover Operation and Maintenance.
Report to the Congress.
2 Dec 81, 46p CED-82-1

Half of the 36 municipal wastewater treatment plants GAO reviewed in 10 States were not raising sufficient funds from their user charge systems to cover operation and maintenance costs. Only 3 of 36 municipalities were setting aside funds to replace treatment plants when they reached the extent of their economical/technological life. Many municipalities indicated that they would return to the Federal Government for replacement funding. GAO is recommending actions to improve administration of the user charge program. GAO also believes the Congress should consider who will be responsible for funding future treatment plant replacement.

PB82-139049 PC **A03**/MF **A01**
Science Applications, Inc., McLean, VA.
Controlling Nitrogen Oxides.
Research summary,
Alice Hastings, and Mark Schaefer. Feb 80, 29p
EPA-600/8-80-004
Contract EPA-68-01-4839

Recent research indicates that nitrogen oxides (NOx) could be one of the most troublesome air pollutants of the 1980's. More than 20 million metric tons of NOx are annually polluting our air as a result of the widespread combustion of fossil fuels in power plants, industrial boilers, and automobiles and trucks. Present levels of NOx emissions already pose a significant threat to our health and environment. Nitrogen oxides are directly harmful to human health, and are precursors of photochemical oxidants such as ozone, the major component of urban smog. They can also be converted into nitric acid, one of the two principal components of acid precipitation. The EPA is actively working with other Federal agencies and the academic, industrial, and private research communities to develop viable combustion technologies which will strictly limit NOx emissions. The authors have prepared this Research Summary to inform the public of the status of their efforts to make improved control technologies available as soon as possible.

PB82-139155 PC **A03**/MF **A01**
KLD Associates, Inc., Huntington, NY.
Integrated Traffic Simulation Model - Phase I. Volume 1: Executive Summary.
Final rept. Sep 76-Dec 79,
E. Lieberman. Sep 80, 42p TR-67, FHWA/RD-80/086
Contract DOT-FH-11-9145
See also Volume 2, PB82-139163.

The report contains (1) An introduction which reviews the utility of traffic simulation and its role as a key element in the transportation management process. The need for an integrated traffic simulation model is discussed and, finally, the objectives of the TRAF system are stated; (2) The conceptual design of TRAF is presented. Two components of the TRAF software system are identified and discussed--The TRAF Integrated Model and The TRAF Operating System; (3) A brief summary of the other volumes is also presented.

PB82-139163 PC **A05**/MF **A01**
KLD Associates, Inc., Huntington, NY.
Integrated Traffic Simulation Model - Phase I. Volume 2: Design of the TRAF Operating System (TOS).
Final rept. Sep 76-Dec 79,
E. Lieberman, B. Andrews, and R. Goldblatt. Sep 80, 98p TR-68, FHWA/RD-80/087
See also Volume 1, PB82-139155 and Volume 3, PB82-139171.

This document describes one of the two components of the TRAF Software System, viz, the TRAF Operating System (TOS). It is written for the software specialist and transportation researcher. The description of the TRAF Operating System details the contents of the TRAF Master File, the design of the TRAF report generator, the design of the TRAF Maintenance Program, and the design of the TRAF Program Generator. Essentially, the TRAF Operating System is designed to maintain the TRAF Master File, provide information describing the contents of this Master File and to generate Fortran coded traffic simulation programs as requested by the user. The report also contains the storage structure of the TRAF Operating System.

PB82-139171 PC **A06**/MF **A01**
KLD Associates, Inc., Huntington, NY.
Integrated Traffic Simulation Model - Phase I. Volume 3: TRAF Operating System Users Guide.
Final rept. Sep 76-Dec 79,
G. Lieberman, B. Andrews, R. Goldblatt, and L. Liu. Sep 80, 104p KLS-TR-87, FHWA/RD-80/088
See also Volume 2, PB82-139163 and Volume 4, PB82-139189.

This volume presents a guide for the user of the TRAF Operating System. It is organized into several sections: General overview of the TRAF Operating System (TOS); Input requirements for the TOS; Output reports generated by the TOS; Error Messages generated by the TOS; and Computer system requirements of the TOS.

PB82-139189 PC **A04**/MF **A01**
KLD Associates, Inc., Huntington, NY.
Integrated Traffic Simulation Model - Phase I. Volume 4: Revisions to UTCS-1 Traffic Simulation Model to Enhance Operational Effectiveness.
Final rept. Sep 76-Dec 79,
E. Lieberman, and A. Wu. Sep 80, 68p FHWA/RD-80/089
Contract DOT-FH-11-9145
See also Volume 3, PB82-139171.

This report describes revisions to the UTCS-1 Traffic Simulation Program to reduce computing (CPU) time, reduce data transfer (I/O) operations, and to reduce storage requirements. The work effort included the refining of the existing code; Incorporating the capability for a variable simulation time-step; Abridging the existing fuel consumption and vehicle emission rate tables; Packing the above tables to conserve storage; and Revising two major routines and developing a new car-following model. The estimated result is to reduce CPU time by at least 30 percent, reduce I/O operations by at least 90 percent and reduce required storage by approximately 10 percent.

PB82-139825 PC **A12**/MF **A01**
Combs (Earl R.), Inc., Mercer Island, WA.
Alaska OCS Socioeconomic Studies Program: St. George Basin Petroleum Development Scenarios, Anchorage Impact Analysis.
Final rept.,
Richard L. Ender, and Susan Gorski. Oct 81, 275p
TR-61, BLM/YK-TR-81/02
Contract DI-AA851-CT0-38
See also PB82-139817.

The report consists of an update to the Anchorage socioeconomic and physical baseline and infrastructure standards used to forecast impacts with and without OCS oil and gas development in Alaska. This material is found in Technical Report 43, Volumes 1 and 2 entitled 'Gulf of Alaska and Lower Cook Inlet Petroleum Development Scenarios, Anchorage Socioeconomic and Physical Baseline and Anchorage Impact Analysis.' These updates should be read in conjunction with the above report. In addition, the Anchorage base case and petroleum development scenarios for the St. George Basin are given. These sections are written to stand alone without reference.

PB82-139940 PC **A06**/MF **A01**
California Univ., Berkeley. Earthquake Engineering Research Center.
TLUSH: A Computer Program for the Three-Dimensional Dynamic Analysis of Earth Dams,
Takaaki Kagawa, Lelio H. Mejia, H. Bolton Seed, and John Lysmer. Sep 81, 118p UCB/EERC-81/14, NSF/CEE-81044
Grant NSF-PFR79-18267
Portions of this document are not fully legible.

Two-dimensional finite element techniques which use the complex response method and therefore permit variations in modulus and damping in different elements of a soil structure have been extended to three dimensions, with a constraint on the possible deformations of the finite element model. The present version of the computer program TLUSH constitutes a further development of these procedures and includes the following: complete freedom for the selection of the direction of the earthquake motions, complete freedom in the deformational modes of the model, a new interpolation scheme, a nodal point and element data generation routine, more efficient element stiffness generation routines and a more efficient program structure that has lower memory requirements. The program TLUSH can take into account the strong nonlinear effects characteristic of soil masses subjected to strong earthquake motions. This is achieved by a combination of the equivalent linear method and the complex response method. Typical relationships between stiffness, damping and effective shear strains for sand and clay are provided within the program. Special options that permit creation of a permanent record of both input and basic information on the complete solution, and recovery of this information for iteration and output purposes are available within the program.

PB82-140641 PC **A10**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Pesticides and Toxic Substances.
TEMEPHOS: O,O'-(thiodi-4,1-phenylene) bis(O,O-dimethyl phosphorothioate), Pesticide Registration Standard.
Aug 81, 204p

Contents:
How to register under a registration standard;
Regulatory position;
Summary of data requirements and data gaps;
Product chemistry;
Environmental fate;
Toxicology;
Residue chemistry;
Ecological effects;
Efficacy.

PB82-141359 PC **A08**/MF **A01**
Argonne National Lab., IL. Div. of Environmental Impact Studies.
Coal Combustion Waste Manual: Evaluating Impacts to Fish and Wildlife.
Final rept.,
Lars F. Soholt, Robert W. Vocke, Vanessa A. Harris, Mark J. Knight, and Barry Siskind. Aug 81, 162p
FWS/OBS-81/05
Contract DI-14-16-0009-79-997

Increased use of coal in the generation of electricity has become national policy. With the anticipated accelerated use of coal as an energy source, a concomitant increase can be expected in the potential for impacts to fish and wildlife resources. The goal of this manual is to provide quantitative guidelines, where possible for evaluating the potential extent of habitat disturbance from waste constituent dispersal. Criteria are also provided for evaluating the potential for impact from trace elements in the waste. This manual is limited to combustion and emission-abatement waste-handling systems and impacts of wastes on fish and wildlife resources.

PB82-141508 PC **A03**/MF **A01**
Department of Transportation, Washington, DC. Office of Univ. Research.
Department of Transportation Awards to Academic Institutions in Fiscal Year 1980,
George K. Megerian, and Helen L. Engrum. Sep 81, 47p DOT/RSPA/DPB-50/81/26
See also report for FY 1979, PB81-191645.

This report is a comprehensive listing of contracts and grants awarded by the U.S. Department of Transportation to colleges and universities during fiscal year 1980.

PB82-144304 PC **A03**/MF **A01**
Real Estate Research Corp., Chicago, IL.
Urban Infill: Opportunities and Constraints.
Working paper,
Deborah Brett, Margery al Chalabi, and Stephen B. Friedman. Jul 79, 45p HUD-0000833
Contract HUD-H-2982

This paper discusses the advantages of urban infill as public policy, documents the problems associated with infill sites, identifies the amount of development that might be accommodated, and suggests how public agencies can make infill parcels more attractive for private development. Urban infill development is the economic use of vacant land in urban areas where water, sewer, and other public services already exist. Infill use results in the reduction of urban sprawl, less duplication of public facilities, preservation of valuable agricultural land, reduced energy costs, and increased tax revenues for older cities and suburbs. The private sector, however, has not developed infill sites because of inadequate capacity and condition of public facilities, developer and consumer willingness to assume the costs of new facilities in outlying areas, and lack of coordination in facility planning and service provision. Land speculation, corporate holding of infill land in reserve, tax delinquency and fragmented ownership issues, and ineffective marketing, among others, also discourage use of infill land. Recent changes in real estate development favoring infill are property tax limitations, surburban growth controls, changing demographics, availability of financing and insurance, and energy considerations. Some potential adverse impacts of infill use are reduction of open lands and of future development options, inflated land and construction costs, and greater State and regional action than was previously acceptable. Research and policy issues are listed.

PB82-144320 PC **A03**/MF **A01**
Department of Housing and Urban Development, Washington, DC. Office of International Affairs.
Productivity Trends in the Construction Industry: A Comparative International Review,
E. Jay Howenstine. 14 Sep 72, 36p HUD/IA-60, HUD-0000958

This overview of European and American studies of construction productivity trends examines long - term productivity in the industry as a whole, productivity trends in specific onsite studies of a man - hour performance, and comparisons of productivity trends in construction with those in the economy as a whole. While the rate of growth in U.S. construction productivity in the pre - World War II period was about 1 percent or less, in the postwar period (1950 - 1970), the growth rate was around 2 percent to 2.5 percent, compared to 4 percent to 6 percent in Europe. However, according to the most comprehensive study of economywide productivity trends during 1953 - 1967, the average European rate of productivity increase in the construction sector was over seven times the U.S. rate. During the postwar period, at least seven countries experienced substantial periods of higher rates of construction productivity growth than in the economy as a whole. In the majority of countries, including the United States, the reverse has been true, although man - hour productivity in the American construction industry appears to be generally higher than in the European construction industry. If further examination confirms that these magnitudes are approximately correct, then the conditions which have enabled European construction to achieve a rate of productivity improvement at least double that of the United States must be identified. Tabular data and footnotes are provided. (Author abstract modified).

PB82-144429 PC **A06**/MF **A01**
California Univ., Berkeley. Inst. of Governmental Studies.
Proposition 13 Research Inventory: A Partial Inventory of Research in the State of California and Elsewhere,
Nicholas D. Bevilacqua, and Theresa M. Larson. Sep 78, 104p HUD-0001984
Grant HUD-H-2944RG

This partial inventory presents research related to the impact of California's Proposition 13. The inventory is intended to (1) identify researchers, sponsoring agencies, and research issues; (2) indicate those areas not being considered and where research should be done; (3) identify data sets available for cooperative research efforts; and (4) provide practitioners in State and local government with ongoing research information. The following research areas are covered: alternatives to the public sector, community and economic development, energy, environment, and fire safety and disaster planning. Other areas are governmental reform and reorganization, health, human services, intergovernmental relations, management, finance, personnel, and police and the criminal justice systems. The inventory also includes political process / social behavior, public education, public works and utilities, revenue, taxation, economics, and transportation research. Generally, topics for each issue area are organized according to project title, principal investigator, research organization, sponsoring agency, grant number, study period, data sets (available or to be collected), and project description (purpose, methodology, product). There is an index to cross reference the work by principal investigator, research organization, sponsoring agency, and State agencies. Each issue area is categorized by key words.

PB82-144544 PC **A02**/MF **A01**
Coalition of Northeast Municipalities, Boston, MA.
State Tax Policy and Urban Economic Development,
Frank Keefe. Oct 79, 22p HUD-0002063
Contract HUD-H-4435

The speech on State governments' role in urban economic development was presented at a summit meeting of over 150 municipal officials in the Northeast. A critical factor in the failure of previous efforts to save the Nation's cities has been the lack of a central role for State governments. Local officials must assist State policymakers in planning their aid programs, particularly regarding the efficacy of various tax break schemes which States have proposed as short - term solutions to urban economic problems. A review of the literature reveals four standard myths concerning

taxes and economic development of which States must be aware. These myths suggest that a reduction in taxes on business will stimulate private investment and create new jobs, that a reduction in overall business taxes in the Northeast will attract firms back from the South, that special State tax breaks will generate new tax revenue through business expansions and employment growth, and that personal taxation has nothing to do with economic development and private investment. The speaker refutes these myths and suggests that State and local economic development policies in the Northeast be reevaluated. Nine references are cited, and the names of four persons interviewed for the speech are appended.

PB82-144551 PC **A06**/MF **A01**
Coalition of Northeast Municipalities, Boston, MA.
Negotiating Fiscal Impacts: A Handbook for Evaluating City Development.
Feb 80, 122p HUD-0002064
Contract HUD-H-4435
Prepared in cooperation with Herr (Philip B.) and Associates, Boston, MA.

This handbook is designed to assist Northeast municipal governments in determining the tax consequences of development proposals. It emphasizes simple approaches which can be easily done by those officials who represent the city in fiscal negotiations or make final decisions and is directed at large and stable or declining cities in the Northeast. Two levels of fiscal impact analysis are outlined: a level 1 sketch review, requiring an investment of about 4 hours in assembling and analyzing background data and perhaps 2 hours in reviewing any individual proposal, and a level 2 reconnaisance study, requiring an investment of about 8 staff hours for background study and another 4 hours for each project analyzed. The steps involved in both levels of analysis are described and illustrated. The steps involve a background study, structure proposal analysis, and proposal analysis. Only basic arithmetic is required, and the approaches outlined are the same for each level of analysis. Numerous exercises are included, and 10 references are cited.

PB82-144577 PC **A03**/MF **A01**
United States Conference of Mayors, Washington, DC. Inst. for Urban and Regional Economic Analysis.
Three Major Issues Influencing Local Financial Management Capacity: The Perspective of Mayors.
Final rept.
02 Mar 81, 32p HUD-0002066
Contract HUD-H-5385SG

Mayors who were members of two standing committees of the Conference of Mayors were surveyed about their views and needs regarding the planning and management of capital infrastructure, energy management strategies for local officials, and informational needs in negotiating with the private sector. The mayors ranked these issues differently according to their cities' size, age, and geographic region. In addition, they viewed as crucial a fourth problem: managing accelerated growth caused by national energy exploration and defense policies. A clear ranking of the issues did not emerge, although the problem of informational needs for private sector negotiation was regarded as the least important. Energy management is clearly the most universal problem, except in the older cities of the Northeast and Midwest with deteriorating capital stock and growing gaps between revenues and expenditures. In addition, the oldest and largest cities see energy management mainly as an issue of cost identification and control and secondarily as preparation for shortage management. In contrast, the newer and larger cities see the energy management issue as also being deeply intertwined with efforts to market and expand public transportation. Furthermore, in the old Northeast and Midwest, planning and management of capital infrastructure are questions of dealing with disrepair and obsolescence, while in the Southwest and Rocky Mountain States, these are questions of the rational and cost - effective servicing of new growth. Appendices presenting a list of participants, a list of workshop documents, the format used in problem statements, and a list of delegates to the national needs assessment conference are provided. (Author abstract modified).

PB82-144593 PC **A10**/MF **A01**
National Association of Counties, Washington, DC.
National Association of Counties' Report on Local Government's Priority Needs for Financial Management Capacity Sharing.
Jan 81, 215p HUD-0002068
Contract HUD-H-5388SG

The National Association of Counties (NACo) conducted three workshops in Minnesota and Florida in January 1981 to find out the priorities and needs of county officials in negotiating with the private sector; managing energy consumption and supply; and planning, managing, and maintaining capital infrastructure. This report describes its methodology and findings. The nominal group technique (involving silent generation of ideas, writing problems statements and solutions and voting on major problem statements) was used at each workshop as a way of finding solutions to a particular problem by a small participant group. Participants viewed State and Federal laws and regulations as the major local government problem because these regulations can keep the county from providing cost - effective services. County needs listed by participants included a system to determine contract cost - effectiveness and techniques to help counties to adequately and effectively plan for energy use and conservation. Participants also saw the main problem in capital infrastructure as the increasing deterioration of local roads, sewers, water treatment facilities, and transportation by bus or rail. These problems, needs, and concerns were presented by three NACo representatives at the HUD - sponsored national conference held February 4 - 6, 1981, in Washington, D.C., on 'Local Government Priority Needs for Financial Management Capacity Sharing.' The document includes a list of participants to NACo's preliminary workshops and representatives to the national conference. Attached are a description of the NACo County Research and Innovation Sharing Project; a letter from the executive director, Association of Minnesota Counties, with the Minnesota County Platform and an energy strategy of the Minnesota Counties Research Foundation; a list of selected resources and a paper on public management needs in negotiating with the private sector; and a letter on areas of suggested local governments needs.

PB82-802364 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Airport Noise. 1964-October, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Oct 81.
Dec 81, 335p
Supersedes PB80-813231, and NTIS/PS-79/0878.

Aircraft created noise, noise intensity, noise exposure, and physiological effects, all in airport environments, are investigated in these research reports. (This updated bibliography contains 327 citations, 42 of which are new entries to the previous edition.)

PB82-802463 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Urban Air Pollution. August, 1979-November, 1981 (Citations from the NTIS Data Base).
Rept. for Aug 79-Nov 81.
Dec 81, 135p
Supersedes PB80-814429, and NTIS/PS-79/0768.

Selected reports are cited on urban air pollution and its abatement. These citations were selected because of their general interest to urban planners, which will enable them to become aware of new abatement strategies and techniques. The majority of the studies cover various aspects of transportation emissions. Other topics include health standards, atmospheric models to aid in planning, law enforcement, abatement policies, and the effects of new modes of transportation. (This updated bibliography contains 129 citations, 72 of which are new entries to the previous edition.).

PB82-802497 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Taxicab Transportation. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 109p
Supersedes PB80-813918, and NTIS/PS-79/0886.

The role of taxicab services as another means of public transportation is cited including services of large taxicab vehicles, multi-origin destination taxi systems responding on demand, and shared ride taxi systems. Vehicle monitoring systems for centralized management to provide location for fleet vehicles are described as are user characteristics and taxi traffic in urban areas. Regulations and ordinances, policies, operating and economic characteristics of the urban taxicab industry including fare structure, computer applications and market studies are covered. (This updated bibliography contains 100 citations, 15 of which are new entries to the previous edition.)

PB82-802547 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Concrete (Rigid) Highway Pavements. 1974-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1974-Nov 81.
Dec 81, 340p
Supersedes PB80-814254, and NTIS/PS-79/0938.

Concrete (rigid) pavement construction, construction materials, and mechanical properties of concrete pavements are evaluated in reports generated under research in highway engineering. (This updated bibliography contains 332 citations, 34 of which are new entries to the previous edition.)

PB82-802562 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Remote Sensing Applied to Urban and Regional Planning. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 82p
Supersedes PB80-813116, and NTIS/PS-79/0843.

Urban and regional planning using aerial photography and satellite remote sensing methods are discussed. Abstracts cover the use of remote sensing in land use mapping, traffic surveys and urban transportation planning, and taking inventories of natural resources for urban planning. Abstracts dealing with land use and residential quality associated with and acting as an influence on health and physical well-being are included. (This updated bibliography contains 74 citations, 5 of which are new entries to the previous edition.)

PB82-802646 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Noise Pollution Economics. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 155p
Supersedes PB80-814155, and NTIS/PS-79/0917.

The economic factors of noise pollution control and management are presented for industry, urban areas, Government planning, and transportation. The majority of reports cover the economic impact of controlling aircraft noise or the impact of motor vehicle noise on society. (This updated bibliography contains 149 citations, 19 of which are new entries to the previous edition.)

PB82-802653 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Nitrogen Removal in Sewage Treatment Systems. 1978-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1978-Nov 81.
Dec 81, 205p
Supersedes PB80-813751, and NTIS/PS-79/0908.
See also 1964-77, NTIS/PS-79/0907.

Most aspects of the removal of nitrogen compounds in sewage treatment systems are covered in these citations. Studies onbreakpoint chlorination, denitration, nitrification, microbiology, tertiary sewage treatment, ammonia stripping, and process design are included. (This updated bibliography contains 149 citations, 49 of which are new entries to the previous edition.)

PB82-802752 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Remote Sensing Applied to Environmental Pollution Detection and Management. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 231p
Supersedes PB80-813140, and NTIS/PS-79/0842.

Application of remote sensing methods to air, water, and noise pollution problems is discussed. Topic areas cover characteristics of dispersion and diffusion by which pollutants are transported, eutrophication of

lakes, thermal discharges from electric power plants, outfalls from industrial plants, atmospheric aerosols under various meteorological conditions, monitoring of oil spills, and application of remote sensing to estuarian problems. (This updated bibliography contains 224 citations, 37 of which are new entries to the previous edition.)

PB82-802794 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Flexible Highway Pavements. September, 1979-November, 1981 (Citations from the NTIS Data Base).
Rept. for Sep 79-Nov 81.
Dec 81, 202p
Supersedes PB80-814502, and NTIS/PS-79/0934.

Flexible pavement construction, construction materials, and mechanical properties of flexible pavements are investigated in these reports. (This updated bibliography contains 195 citations, 101 of which are new entries to the previous edition.)

PB82-802802 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Hazardous Materials Transportation. 1970-October, 1981 (Citations from the Engineering Index Data Base).
Rept. for 1970-Oct 81.
Dec 81, 315p
Supersedes PB80-813082, and NTIS/PS-79/0705.

Worldwide journal research is cited on transportation of hazardous chemicals, gases, and explosives. The majority of studies concern liquified natural gas transportation. Tanker ships, containers, and pipelines for these materials are discussed. Descriptions of accidents, spills, handling, loading, and equipment design are covered. Mathematical models and simulations are included. (This updated bibliography contains 308 citations, 45 of which are new additions to the previous edition.)

PB82-802877 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Tunnel Construction. August, 1979-June, 1980 (Citations from the Engineering Index Data Base).
Dec 81, 178p

Unique tunneling methods, cost studies, tunnel support innovations, tunneling machines, and soil and rock properties encountered are investigated in these reports gathered in a worldwide literature survey. Vehicular, water, sewage, and mine tunnels are reviewed. Finite element analysis is used extensively for investigation of soil and rock mechanics. (This updated bibliography contains 173 citations, none of which are new entries to the previous edition.)

PB82-802885 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Tunnel Construction. July, 1980-November, 1981 (Citations from the Engineering Index Data Base).
Dec 81, 213p
Supersedes PB80-814338, and NTIS/PS-79/0902.

Unique tunneling methods, cost studies, tunnel support innovations, tunneling machines, and soil and rock properties encountered are investigated in these reports gathered in a worldwide literature survey. Vehicular, water, sewage, and mine tunnels are reviewed. Finite element analysis is used extensively for investigation of soil and rock mechanics. (This updated bibliography contains 208 citations, all of which are new entries to the previous edition.)

PB82-802893 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Tunnel Construction. 1977-November, 1981 (Citations from the NTIS Data Base).
Dec 81, 244p
Supersedes PB80-814312, and NTIS/PS-79/0900.

Unique tunneling methods, cost studies, tunnel support innovations, tunneling machines, and soil and rock properties encountered are investigated in these Government-sponsored research reports. Vehicular, water, sewage, and mine tunnels are reviewed. Finite element analysis is used extensively for investigation of soil and rock mechanics. (This updated bibliography contains 236 citations, 60 of which are new entries to the previous edition.)

PB82-802935 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Sewage Sludge Disposal. 1975-November, 1981 (Citations from the NTIS Data Base).
Dec 81, 356p
Supersedes PB80-813025, and NTIS/PS-79/0657. See also 1964-74, NTIS/PS-77/0409.

Citations of Federally-funded research on sludge disinfection, irradiation, digestion, dewatering, decontamination for land disposal, recycling, incineration, and ocean disposal are presented. The effect of sewage sludge disposal on water pollution, ecosystems, and the environment is also covered. Studies on regulations, legislation, costs, and planning are included. (This updated bibliography contains 348 citations, 54 of which are new entries to the previous edition.)

PB82-802943 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Sewage Sludge Disposal. February, 1976-November, 1981 (Citations from the Engineering Index Data Base).
Dec 81, 338p
Supersedes PB80-813033, and NTIS/PS-79/0658.

Citations of worldwide studies on sludge recycling, land application, incineration, biological degradation, and ocean dumping are presented. Sludge dewatering, drying, freezing, detoxification, piping, and fermentation are among topics included. Chemical analysis, water pollution impacts, soil fertilization, and crop monitoring are also covered. (This updated bibliography contains 331 citations, 33 of which are new entries to the previous edition.)

PB82-859349 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Activated Sludge treatment. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for Jan 78-Dec 81.
Dec 81, 268p
Supersedes PB81-852915.

Reports are cited which discuss various aspects of the activated sludge process in treating industrial and domestic waste. Included are citations dealing with apparatus design, parameters for effectiveness, and organisms utilized in the various processes. Performance evaluations and applications of the various processes for the purification and removal of unwanted substances from sewage and waste water are included. (This updated bibliography contains 312 citations, 61 of which are new entries to the previous edition.)

PB82-859612 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Waste Water Treatment. June, 1970-1981 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Dec 81.
Dec 81, 126p
Supersedes PB80-858541.

This bibliography covers methods and technology for the treatment and purification of industrial effluents and the recycling of various effluent components. Effluents from mining and related activites are excluded. (This updated bibliography contains 126 citations, 37 of which are new entries to the previous edition.)

PB82-859620 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Waste Water Treatment. June, 1976-1981 (Citations from the Energy Data Base).
Rept. for Jun 76-Dec 81.
Dec 81, 72p
Supersedes PB80-858533. Prepared in cooperation with the Department of Energy, Washington, DC.

Citations in this bibliography cover techniques and technology for treatment of industrial (except mining) effluent streams. Consideration is given to the removal, reclamation, and recycling of various stream components. (This updated bibliography contains 59 citations, 20 of which are new entries to the previous edition.)

PB82-859679 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Marine Terminals. 1970-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 203p
Supersedes PB81-854606.

The design and operation of international ocean port terminals are considered in this bibliography. Computer utilization and automation in container ports are discussed. Bulk and container handling equipment, and roll-on/roll-off, reefer, crane and non-flow bulk systems are included. (This updated bibliography contains 238 citations, 24 of which are new entries to the previous edition.)

13C. Construction Equipment Materials, and Supplies

AD-A107 422/8 PC **A04**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Structures Lab.
Tensile Tests on Articulated Concrete Mattress Specimens.
Final rept.,
Dale Glass. Oct 81, 71p Rept no. WES/MP/SL-81-28

An investigation was undertaken to determine the feasibility of using crimps in the reinforcement in fabrication of articulated concrete mattress. The crimps would maintain the reinforcement in proper position during casting, thus eliminating the support system currently being used. In contrast to the straight reinforcing, crimps in the reinforcing caused cracking/spalling of the concrete in each panel tested. Overall, the initial concrete cracking/spalling load averaged 2449 lbf or approximately 47 percent less than the ultimate load as determined on panels with straight reinforcing. Overall, the ultimate tensile load of bracket wires with crimps averaged 50 lbf higher than bracket wires without crimps. Similarly, the ultimate tensile load of longitudinal wires with crimps averaged 84 lbf higher than longitudinal wires without crimps. (Author)

AD-A107 524/1 PC **A04**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Structures Lab.
Evaluation of Tests for Determining the Pumpability of Concrete Mixtures.
Final rept.,
Steven A. Ragan. Oct 81, 53p Rept no. WES/MP/SL-81-29

This report evaluates two methods currently proposed for determining concrete pumpability: (a) the pressure bleed test method and (b) a checklist analysis which examines 10 variables of concrete mixtures and their effects on concrete pumpability. Part of the investigation consisted of a laboratory study in which 14 mixtures containing a combination of both rounded (natural) and angular (crushed) coarse aggregate, natural and manufactured fine aggregate, mineral admixtures, steel fibers, and a high-range water-reducing admixture were analyzed using both proposed procedures and then pumped. The other part comprised a field study in which two concrete mixtures were analyzed and then pumped at two project locations. One contained natural coarse and fine aggregate and the other contained manufactured coarse and fine aggregate. All concrete mixtures were air entrained. It was concluded that the pressure bleed test method is effective only in determining the pumpability of concrete using a poorly maintained and leaky pump. The checklist analysis, although conservative, is a better indicator of pumpability and should be considered for inclusion in an appropriate Engineer Manual or Engineer Technical Letter.

N82-11277/2 PC **A03**/MF **A01**
South African Bureau of Standards, Pretoria.
Standard Specification for Light Ladders.
5 Nov 80, 29p SABS-1304-1980, ISBN-0-626-05677-2
In English and Afrikaans.

Requirements are given for the construction, inspection, and testing of single ladders, extension ladders,

step-ladders, extending step-ladders, trestle ladders, extending trestle ladders, and special purpose ladders. The composition of the aluminum alloys, and of the steels and glass fiber reinforced polyester components coming into contact with the aluminum are included. Coatings used to provide corrosion resistance are also specified.

PB82-132135 PC **A04**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Dept. of Civil Engineering.
Stochastic Approach to Study the Influence of Rate of Loading on Strength of Concrete,
H. Mihashi, and F. H. Wittmann. 1980, 57p
Pub. in HERON, v25 n3 1980.

Although any reliability analysis depends on the entering load and resistance distribution functions, the actual materials behavior has been neglected in many reliability assessments. Strength of concrete is widely scattered because of the heterogeneity of this composite material. So far no generally accepted theory to describe the stochastic nature of concrete properties is available. Beside this, hardly anything is known on the influence of rate of loading on the variability of strength of concrete. In this paper, a stochastic theory for fracture of concrete materials is presented. This theory is based on physically relevant probability models. It is possible to describe the fracture process not only under monotonically increasing load, but also under time-dependent loading conditions such as sustained load and repeated load. Moreover, this theory provides a realistic basis for a mathematical formulation of the variability of porous materials. Theoretical predictions are compared with earlier published data. Experiments have been carried out to verify the theoretical approach described in this report. Special emphasis is placed on the influence of rate of loading on the mean strength and the corresponding variability. The rate of loading has been changed by three orders of magnitude and for most series six different rates have been chosen within this range. Specimens of high strength mortar, low strength mortar, lightweight and normal concrete have been tested under compressive and bending load. The distribution function has been evaluated from about 30 individual tests for each chosen condition of loading some experiments to investigate the influence of temperature have been carried out.

PB82-132390 PC **A04**/MF **A01**
Foster-Miller Associates, Inc., Waltham, MA.
Improvement of Device (CMD) for Monitoring the Consolidation of Plastic Concrete.
Final rept.,
George J. Kirby, and Richard W. Lusignea. Aug 81, 72p DOT-7932, FHWA/RD-81/117
Contract DOT-FH-11-9630

This report describes a program to develop an automatic distance gauging system for use in a device (CMD) for monitoring the consolidation of a portland cement concrete pavement. The capacitive distance gauging system measures the air gap between the surface of the pavement and the bottom of a gamma backscatter instrument for density monitoring. The incorporation of the capacitance gauging system has successfully made the density measurement independent of air gap height variations normally encountered as the concrete pavement surface is extruded behind a paving machine. Laboratory and field testing programs are described, and recommendations are made for further development and application of the density monitoring system.

PB82-132630 PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Recommendations for Road Surface Dressing.
c1981, 29p ROAD NOTE-39, ISBN-0-11-550554-7

Surface dressing can be used successfully on roads of all types, from the country lane that carries only an occasional vehicle to trunk roads and motorways carrying many thousands of vehicles a day. It provides a low-cost and basically simple form of maintenance but it frequently happens that less attention is paid to its control and supervision than is given to more expensive forms of construction. Lack of care may shorten the useful life of surface dressing, and the benefits of adequate control, particularly in the period when traffic is first allowed to pass over the new dressing, cannot be emphasized too strongly. The recommendations contained in this revised note are based on systematic full-scale trials and experiments undertaken over a period of many years by the Transport and Road Research Laboratory in close collaboration with various highway authorities and with industry. The note is designed to give guidance on the preparation of specifications necessary to cater for the wide range of traffic conditions and type of road surface likely to be encountered. Managers and supervisors of surface dressing programs should also consult 'A Guide to Road Surface Dressing Practice' which constitutes a code of practice on the execution of surface dressing operations. (Copyright (c) Crown Copyright 1981.)

PB82-132705 PC **A04**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Dept. of Civil Engineering.
Concrete Mechanics. Part A. Theory and Experiments on the Mechanical Behaviour of Cracks in Plain and Reinforced Concrete Subjected to Shear Loading,
J. C. Walraven, and H. W. Reinhardt. 1981, 72p
Pub. in HERON, v26 n1A 1981.

As result of the increasing difficulties in structural design associated with the increase in scale and complexity of new structures and their loading conditions in recent years, added impetus has been given to the development of numerical calculation techniques. Above all, the nonlinear finite element methods, which are still being refined, may become powerful tools in future design. These methods, however, can only show to full advantage if the material characteristics to be inserted are adequately known. One of the characteristics affected by lack of information concerns the mechanism of transmission of forces across cracks whose faces are subjected to shear displacements. This mechanism is achieved by interaction of several components: axial and transverse stiffness (dowel action) of the reinforcement and direct transfer of forces between the rough concrete crack faces, generally denoted by the term 'aggregate interlock'. Experimental research and the derivation of a theoretical model gave insight into this phenomenon. Tests were carried out on precracked shear specimens. Variables in the tests were: the type of reinforcement (embedded reinforcing bars, external restraint bars), the concrete strength, the type of the concrete (sand gravel concrete, lightweight concrete), the grading of the concrete (continuous, discontinuous), the scale of the concrete, and the initial crack width. Measurements have been carried out for determining the shear force, the crack displacements and, for the specimens with external reinforcement, the force in the restraining bars.

PB82-132713 PC **A05**/MF **A01**
Instituut TNO voor Bouwmaterialen en Bouwconstructies, Delft (Netherlands).
Concrete Mechanics. Part B. Numerical Modelling of Bond-Slip Behaviour,
A. K. de Groot, G. M. A. Kusters, and T. Monnier. 1981, 94p
Pub. in HERON, v26 n1B 1981.

The development and verification of a numerical bond-slip element suitable for plain as well as for deformed (ribbed) reinforcing bars is reported. First, the formula for the axially symmetric case are derived; then the results are generalized to the three-dimensional case. Next, a procedure for effecting the transformation to the case of plane stress is proposed. After the theoretical treatment of the subject, the suitability of the bond-slip element is assessed with reference to experimental results. More particularly, these relate to tests on cylindrical specimens by Dorr and Mehlhorn, tests on rectangular prisms, and tests on specimens representing the end portions of beams. Finally, on the basis of the experience gained in the course of this verification, recommendations are made for the various parameters that govern the behavior of the bond-slip element.

PB82-132721 PC **A05**/MF **A01**
Technische Hogeschool Twente, Enschede (Netherlands).
Concrete Mechanics. Part C. Numerical Models for Reinforced Concrete Structures in Plane Stress,
H. J. Grootenboer, S. F. C. H. Leijten, and J. Blaauwendraad. 1981, 87p
Pub. in HERON, v26 n1C 1981.

This report delineates the development of two numerical models for the analysis of reinforced concrete structures in plane stress. In an introductory chapter the motives for this study are outlined and the essentials of reinforced concrete structures are reviewed. This survey indicates the need for analysis, which led to the decision to derive a Micro-model and a Macro-model. The Micro-model is a program based on a special type of finite element method for plates in plane stress. Material nonlinearities can be dealt with, but geometrical nonlinearity has not been taken into account. Bond and bond slip are modelled. Probably a feature which attracts most attention is the possibility of having discrete cracks across elements in any direction. This makes the program particularly well suited to simulate structures which fail in a brittle mode in which one crack or just a few cracks dominate their behavior. The program is called MICRO/1. The Macro-model is a program for plane beams and framed structures. Material nonlinearities as well as geometrical nonlinearities are dealt with. In this program the concept of 'smeared-out' cracks is applied. Only bond and bond slip between the main reinforcing bars and the concrete are modelled. The aim of the program is to calculate the global behavior of a beam up to failure load, rather than to study detailed stresses as in the case of the Micro-model. The Macro-model program is called MACRO/1.

PB82-132929 PC **A03**/MF **A01**
Instituut TNO voor Bouwmaterialen en Bouwconstructies, Delft (Netherlands).
Geometrical Non-Linearity in Collapse Analysis of Thick Shells, with Application to Tubular Steel Joints,
R. S. Puthli. 1981, 34p
Pub. in HERON, v26 n2 1981.

Geometrical nonlinearity is important, not only in problems involving elastic instability of thin structures, but also where they influence collapse in the material nonlinear range involving thicker members. Using a continuum approach, this paper presents the basic principles of the general finite element formulation for thick shells that have been incorporated in an existing general purpose computer program suite DIANA with a very modular architecture. The common assumptions of classical plate or shell theories have not been applied. Material nonlinearity has only been mentioned briefly, where it involves plasticity in structural steel. A comparison with the collapse analysis of a steel shell using conventional classical plate/shell theory is presented to illustrate variations that are ignored in classical theory. Experimental results on the collapse behavior of a tubular steel T-joint are briefly compared with a numerical simulation, where the theoretical effects of geometric or material nonlinearity alone are also presented.

PB82-132937 PC **A03**/MF **A01**
Instituut TNO voor Bouwmaterialen en Bouwconstructies, Delft (Netherlands).
General Derivation of Hardening Formulas,
A. K. de Groot, and G. M. A. Kusters. 1980, 46p
Pub. in HERON, v25 n1 1980.

The usefulness of the elasto-plastic arithmetical model for describing the behavior of a material such as concrete depends to a great extent on the hardening rules to be applied. Without going into the background of these rules and without expressing a preference, it will be endeavored in this article to give a general derivation of the hardening formulas, as opposed to the usual procedure of treating the hardening rules for each particular yield criterion. After the general derivation, the formulas are further developed for a number of well-known yield criteria. Furthermore, the possibility of interpolation between different hardening diagrams is discussed, without implying that the interpolation methods presented here are necessarily the most suitable. The need for some form of interpolation must be recognized, however. In many publications this problem is ignored, thus creating the impression that these are not matters likely to cause any difficulties. Finally, it is pointed out that the manner in which a particular yield criterion is formulated may sometimes make arithmetical treatment more difficult.

PB82-132945 PC **A03**/MF **A01**
Instituut TNO voor Bouwmaterialen en Bouwconstructies, Delft (Netherlands).
A Simplified Approach to Creep Buckling and Creep Instability of Steel-Concrete Columns,
A. W. de Jongh. 1980, 42p
Pub. in HERON, v25 n4 1980.

The effect of the creep of concrete on the physical and geometrical nonlinear behavior of concrete columns is dealt with in this article. The aim has been to achieve simplicity of treatment by choosing conveniently ma-

nipulatable mathematical models. The geometrical nonlinear behavior of columns is reduced to essentials with the aid of discrete kinematic models. The material strain behavior of concrete is schematized by rheological models. With the aid of these models the concepts of creep buckling and creep instability are analyzed. By creep buckling is understood the academic case of a slowly buckling straight strut under axial (centric) load. Creep instability denotes the real phenomenon of sudden instability of a column occurring a long time after load application in consequence of its attaining a critical deflection due to time-dependent effects. Further, the effect of the reinforcing steel in a concrete column upon the creep deformation behavior of the column is investigated. The choice of model enables the problems involved to be properly visualized, and qualitative insight into the extent to which various parameters affect the creep deformation behavior of concrete columns is obtained. The approach presented here can, for example, be useful in interpreting computer calculations or in assessing the creep sensitivity of a concrete structure.

PB82-133661 PC **A06**/MF **A01**
Oklahoma Univ., Norman. School of Chemical Engineering and Materials Science.
Polymer Impregnated Concrete and Polymer Concrete Overlays. Volume I.
Final rept.,
Dauda A. Ismalia, T. S. Young, and Carl E. Locke.
Apr 80, 125p FHWA/OK-80/001
See also Volume 2, PB82-133679. Sponsored in part by Oklahoma Dept. of Transportation, Oklahoma City. Also available in set of 3 reports PC E12, PB82-133653.

The feasibility of impregnating bridge decks with methyl-methacrylate for protection against freeze-thaw deterioration and corrosion of the reinforcing steel is reported. Parameters such as monomer system, monomer loading, drying temperature and time, curing temperature and time, soak time and equipment were investigated and discussed. A non-destructive method for the determination of the polymer depth in a polymer impregnated concrete was investigated and reported. The three methods that are presently used to place polymer concrete overlay on bridge decks were tested and compared with each other.

PB82-133679 PC **A06**/MF **A01**
Oklahoma Univ., Norman. School of Chemical Engineering and Materials Science.
Polymer Concrete Patching. Volume II.
Final rept.,
Chris Root, Dauda A. Ismalia, and Carl Locke. Apr 80, 102p FHWA/OK-80/002
See also Volume 1, PB82-133661, and Volume 3, PB82-133687. Sponsored in part by Oklahoma Dept. of Transportation, Oklahoma City.
Also available in set of 3 reports PC E12, PB82-133653.

This report discusses the use of impermeable, high strength, quick setting polymer concrete as a patching for deteriorated bridge decks. A complete procedure for bridge deck patching is presented. Both laboratory and field tests of polymer concrete were performed. Experiments include determination of cure time and compressive strength for various monomer mixes. Field patches on several Oklahoma bridge decks were placed with the help of the Oklahoma Department of Transportation. The two commercial patching materials, Dupont's Crylon and Rohm and Haas' Plexicrete were also tested. Formulation of the proper monomer system for a polymer concrete mix with suitable properties for bridge deck patching from 20F to 130F is presented. The cost of polymer concrete is estimated at about $16 per cubic foot of patch volume.

PB82-133687 PC **A03**/MF **A01**
Oklahoma Univ., Norman. School of Chemical Engineering and Materials Science.
Polymer Concrete Patching. Volume III. User's Manual.
Final rept.,
Chris R. Root, Dauda A. Ismalia, and Carl E. Locke.
Apr 80, 39p FHWA/OK-80/003
See also Volume 2, PB82-133679. Sponsored in part by Oklahoma Dept. of Transportation, Oklahoma City. Also available in set of 3 reports PC E12, PB82-133653.

Polymer concrete is a quick setting, high strength, durable patching material used to repair reinforced portland cement concrete. Cure times of approximately one hour can be obtained from 20F to 130F. The complete patching procedure is discussed including the preparation of the patch, calculation of the amount of materials required, and the mixing and placing of the polymer concrete. Suppliers of the chemicals used are listed. Proper storage, disposal, and safety procedures are also outlined. The cost of polymer concrete is also calculated for the methyl methacrylate (MMA) system used in this study. A materials cost (early 1980) of about $16 per cubic foot or $430 per cubic yard is expected.

PB82-133729 PC **A04**/MF **A01**
North Carolina State Univ. at Raleigh. Highway Research Program.
Mixing Water and Maturity of Hardened Concrete Using Scanning Electron Microscope Techniques. Part One.
Final rept. Aug 78-Jun 81,
W. G. Mullen, and B. D. Barnes. Jun 81, 67p ERSD-110-79-5, FHWA/NC-81/004
Sponsored in part by North Carolina State Dept. of Transportation, Raleigh.

Photographic comparison standards and an analysis procedure for their use have been developed to aid in the determination of the age of hydration and the water-cement ratio of hardened concrete. The standards are sets of nine photographs of concrete at a range of ages and water-cement ratios taken at 1200X magnification using the scanning electron microscope (SEM). Concretes were made at nine different water-cement ratios ranging from 0.40 to 1.20 in increments of 0.10 and hydration was terminated for samples from each water-cement ratio at 1, 3, 7, 14, 28, 60 and 90 days of hydration using controlled non-freezing vacuum drying. An array of 63 sets of nine photographs, one for each age at each water-cement ratio resulted. Analysis of their array resulted in the recognition of nine factors of features of the hydration matrix that can be used by a trained observer to estimate age of hydration and water-cement ratio of an unknown concrete sample for which a set of nine 1200X SEM photographs has been made. A step by step procedure is provided using the age and water-cement ratio distribution of the nine features for the evaluation of unknown concrete samples. Sample photographs illustrating the nine hydration features are provided together with a distribution chart for each feature.

PB82-134370 PC **A02**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Thermal Conductivity of a Concrete Mortar from 95 K to 320 K,
L. L. Sparks. Oct 81, 17p NBSIR-81-1651
Sponsored in part by Maritime Administration, Washington, DC.

The thermal conductivity of a single concrete mortar specimen with varying moisture content is reported in the temperature range from 95 to 320 K. The measurements were made in a guarded-hot-plate apparatus (ASTN C-177). Moisture migration caused by temperature gradients was minimized by studying the saturated specimen in the low-temperature region. Specimen moisture content and concomitant thermal conductivity were altered by imposing low-pressure, high-temperature conditions on the specimen. The effect of changing the moisture content is discussed.

PB82-135351 PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Surface Dressing in Developing Countries: Research in Kenya,
L. S. Hitch. c1981, 43p TRRL-LR-1019
Also pub. as ISSN-0305-1293.

In many developing countries surface dressing is used as a running surface on new low-cost roads as well as a maintenance treatment for existing roads. These countries are usually characterized by combinations of road surface condition, traffic, climate, and materials, that are not found in Britain and that are not favorable for good surface dressing. In such cases the recommendations for road surface dressing given in Road Note 39 which is intended for use in Britain, are not applicable. Jackson (1963) has proposed a method of surface dressing design based partly upon ideas put forward by Hanson (1935). This method was used to design a total length of 27 km of experimental sections of surface dressing in Kenya during 1975-77. This report describes the construction, monitoring and performance of the sections during the first 3--4 years trafficking. It is concluded that Jackson's design method works satisfactorily in Kenya conditions over the range of chipping size used in these trials, namely 5 mm to 13 mm average least dimension. (Copyright (c) Crown Copyright 1981.)

PB82-135690 PC **A03**/MF **A01**
New York State Dept. of Transportation, Albany. Engineering Research and Development Bureau.
Acceptance Sampling of Steel Reinforcing Bars.
Research rept.,
John B. DiCocco. Nov 73, 39p NYSDOT-ERD-73-RR-18
Sponsored in part by Federal Highway Administration, Washington, DC.

Most sampling schemes in general use for inspection of construction materials are rule-of-thumb sampling plans, whose inefficiency has long been known. This is now being recognized nationally. To begin correcting this situation, the New York State Department of Transportation Materials Bureau requested that valid acceptance sampling plans be prepared for four construction materials. This report is the first of a series in response to that request, and deals with acceptance sampling of steel reinforcing bars. A new acceptance sampling plan is presented, designed to assure the quality levels set as requirements by the Department's Structures Subdivision. In addition, reasons and supporting data for the sampling plan chosen are also presented.

PB82-136979 PC **A19**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Noise Abatement and Control.
Noise Emission Standards for Construction Equipment: Proposed Wheel and Crawler Tractor Noise Emission Regulation. Part 1. Draft Environmental Impact Statement, Economic Impact Statement. Part 2. Background Document.
Jun 77, 432p EPA-550/9-77-250

This document presents an assessment of the expected environmental benefits and economic effects of the Proposed Noise Emission Regulations for Wheel and Crawler Tractors. The information presented includes the statutory basis for the action, a summary of the proposed regulation, a description of the existing wheel and crawler tractor environment, the alternatives considered, the expected environmental benefits, the expected economic effects, and conclusions. In addition, this document presents the background information used by EPA in developing proposed regulations to limit the noise emissions from new wheel and crawler tractors, including: the industry and the product, measurement methodology, baseline noise levels, health and welfare benefits, noise control technology, economic analysis, enforcement actions and existing State, local and foreign regulations.

13D. Containers and Packaging

N82-11464/6 PC **A02**/MF **A01**
South African Bureau of Standards, Pretoria.
Standard Specification for Air-Brake Reservoirs.
5 Nov 80, 17p SABS-1312-1980, ISBN-0-626-05679-9
In English and Afrikaans.

This specification covers the requirements for air-brake reservoirs of the single-compartment or the multi-compartment type, that have in both cases a capacity in the range 5-100 pounds and a maximum working pressure not exceeding 2,000 kPa. These reservoirs are not to be used for applications where the Factories, Machinery and Building Work Act or Mines and Works Act applies.

PB82-859844 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Boxboard Gluer: Scoring, Folding and Sealing Paperboard Cartons. 1976-1981 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 159p

This bibliography cites reports related to the automated mechanisms used in the paperboard packaging industry for scoring, folding, and sealing closed cartons. The sealing and closing of packs are emphasized in this bibliography. Such topics as closure systems, child protection, crash lock-bottom configurations, adhesion reliability of folded coated cardboard carton flaps, cost factors of various box-gluer systems, and evaluation of hot-melt adhesives are included. Several box-gluers offered by different manufacturers are evaluated relative to performance. (Contains 107 citations fully indexed and including a title list.)

13E. Couplings, Fittings, Fasteners, and Joints

AD-A107 112/5 PC **A02**/MF **A01**
Forest Products Lab., Madison, WI.
Analysis of Continuous Beams with Joint Slip.
Forest service research note,
Lawrence A. Soltis. Jul 81, 19p Rept no. FPL-FSRN-0244

A computer analysis with user guidelines to analyze partially continuous multi-span beams is presented. Partial continuity is due to rotational slip which occurs at spliced joints at the supports of continuous beams such as floor joists. Beam properties, loads, and joint slip are input; internal forces, reactions, and deflections are output.

DE81032002 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Influence of Irradiation on the Tensile Properties of Austenitic Stainless Steel Weldments.
F. W. Wiffen, D. P. Edmonds, J. A. Horak, and J. F. King. 1980, 17p CONF-8009179-6
Contract W-7405-ENG-26
ADIP program review meeting, Germantown, MD, USA, 30 Sep 1980.

Weldments in the first wall and front sections of the blanket of a fusion reactor will be exposed to approximately the same operating conditions as will the base metal. Thus the irradiation response of weld metal, of the weld heat affected zones in the base metal, and of the base metal are all of equal concern. Austenitic stainless steels will most likely be joined by a gas tungsten arc welding process. Welds have been made by this process between sections of 6-mm-thick (0.25 in.) base plate of type 316 in the 20%-cold-worked condition, with either type 316 or 16-8-2 stainless steel filler metal. Rod tensile specimens were cut through the welds, containing weld meta in the central gage portion. Weld-contaning tensile specimens have been irradiated in HFIR at 55 exp 0 C and throughout the temperature range 280 to 620 exp 0 C. The neutron fluences ranged from 0.5 to 1.6 x 10 exp 26 n/m exp 2 (> 0.1 MeV). The corresponding displacement damage levels range from 4.5 to 12.1 dpa, and the helium generation from the thermal neutron captures in nickel resulted in 100 to 550 at. ppM He. (ERA citation 06:035730)

13F. Ground Transportation Equipment

AD-A107 447/5 PC **A08**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Identification of Wheelset/Rail Creep Coefficients from Dynamic Response Data Using the Maximum Likelihood Parameter Identification Technique.
Master's thesis,
William N. Herzog. Jan 79, 160p Rept no. AFIT-CI-79-254T

This thesis explores the application of the maximum likelihood parameter identification technique to determine the wheel/rail creep coefficients using dynamic response data. The equations of motion for the dynamically scaled wheelset are presented and the reduced form of the maximum likelihood equations as applicable to the dynamically scaled wheelset model are developed. The maximum likelihood equations were formulated into a maximum likelihood algorithm which was implemented in Fortran IV. Using simulated wheelset data, the effects of a random input representation of the track versus a deterministic input with uncertainty representation are determined. The effects of various levels of measurement noise are also examined. This preliminary analysis indicates that the deterministic representation of the track input yields better results. Representing the track as a random track input requires further investigation into the effects of longer data records and smaller time steps on the performance of the maximum likelihood algorithm. (Author)

DE82000433 PC **A05**/MF **A01**
National Center for Analysis of Energy Systems, Upton, NY.
Method for Estimating Technological Penetration Rates in Commercial Automobile Fleets.
J. R. Wagner. Nov 80, 84p BNL-51312
Contract AC02-76CH00016

A technique for estimating market penetration rates of electric and hybrid cars in commercial (including police and nonfederal government) fleets is described. The approach is also applicable to other vehicle technologies in the fleet market. It employs survey data collected from 142 fleet operators in March 1979. The data describe physical and economic criteria used by fleet operators to select vehicles. This information, together with a variety of derived relationships and constants, provides the basis for a computer simulation model called CPEN (Fleet Car Market Penetration Simulator). The CPEN user provides data describing the physical and economic attributes of hypothetical vehicles. CPEN then produces market penetration estimates, based on the physical capabilities, purchase prices, and discounted life-cycle costs of alternative vehicles. (ERA citation 06:035108)

PB82-106436 PC **A06**/MF **A01**
Thayer School of Engineering, Hanover, NH.
Techniques for Analyzing the Performance of Rural Transit Systems. Volume I.
Final rept. Dec 77-Dec 78,
Thomas J. Adler, S. Russell Stearns, and Yorgos J. Stephanedes. Oct 80, 104p DOT/RSPA/DPB-50/80/23
Contract DOT-OS-80006
See also Volume 2, PB81-177792.

The availability of public transit systems in rural areas has generally declined over the past two decades. Major new federal programs, however, are beginning to provide money for support of existing and proposed rural transit systems. The objectives of this research was to determine how these systems can be designed so as to be maximally effective in providing transportation service. In working toward this objective, detailed case studies and statistical studies were conducted to relate transit performance with different design factors.

PB82-106873 PC **A04**/MF **A01**
Environmental Protection Agency, Ann Arbor, MI. Test and Evaluation Branch.
Directory of Information for Dynamometer Testing of 1979-1981 Light Duty Motor Vehicles,
John C. Shelton. Aug 81, 62p EPA-AA-TEB-81-25
See also report dated Oct 80, PB81-207391.

This report contains information for use in dynamometer testing of 1979 through 1981 model year light duty vehicles. The information was originally compiled for use in Emission Factor programs which are conducted by the Test and Evaluation Branch of the Emission Control Technology Division. Emission Factor programs involve testing of large numbers of in-use light-duty trucks and passenger cars at various locations throughout the country. An EPA report 'Index to Emission Factor Testing Programs', EPA-AA-TEB-81-3, contains more information about these programs. The information contained in this document can be used by EPA, independent laboratories, and others who conduct emission tests on passenger cars and light-duty trucks for purposes other than certification. The primary purpose is for laboratories who test vehicles in Emission Factor programs and for evaluation of retrofit devices, including fuel additives, oils and oil additives.

PB82-130857 PC **A03**/MF **A01**
Harrington, George and Dunn, Atlanta, GA.
Investigation of Design Standards for Urban Rail Transit Elevated Structures.
Final rept.,
B. W. Harrington, Jr. Jun 81, 49p UMTA-GA-06-0010-81-1
Contract DOT-UT-90013

During the past decade, mass or public transportation has received an increase in attention as a viable transportation mode within highly urbanized areas. This increase in recognition of the mass transit mode of moving people, largely came about as a result of congestion of cars on urban highways and streets. At about the same time as automobile congestion was becoming critical, organized opposition to construction all but stopped cities from relieving their transportation problems. It was these events that prompted urban communities to look at alternate transportation modes, such as elevated rail transit systems. The purpose of this report was to review the various criteria for design of elevated rail transit structures currently in use by selected transit properties and to determine the feasibility of industrywide guidelines for their design, and to compile them in one source.

PB82-133273 PC **A05**/MF **A01**
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
Properties of Antilock Systems: Descriptive Parameters Used in Analyzing the Braking and Handling of Heavy Trucks. Volume 5.
Final rept. 1 Jul 77-30 Apr 81,
C. C. MacAdam, and P. S. Fancher. May 81, 95p UM-HSRI-81-19-5
See also Volume 2, PB82-121203.Portions of this document are not fully legible.

This volume is one of a set of five volumes being prepared under support from the Motor Vehicle Manufacturers Association. The set of volumes is entitled 'Descriptive Parameters Used in Analyzing the Braking and Handling of Heavy Trucks.' The volumes address the acquisition of data on (1) steering and suspension systems, (2) inertial properties, (3) tires, (4) brakes, and (5) antilock systems. In this volume, results of laboratory tests performed on five commercial air brake antilock systems are discussed. A hybrid computer has been used to simulate wheel dynamics and to control test sequencing. Test results for each system under a variety of simulated test conditions have been digitized and stored on magnetic tape.

PB82-135591 PC **A09**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
Non-Contacting Suspension and Propulsion Systems for Transportation Applications,
R. Katz, C. Swanson, and L. del Cid. May 81, 197p MTR-80W376, DOT/RSPA/DPB/25-81/16
Contract DOT-RC-92053

This report documents world-wide research and development in non-contacting propulsion and/or suspension for urban and intercity ground transportation. The final section deals with recent research programs in non-contacting propulsion and suspension technology.

PB82-135773 PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
The Role of an Understanding of Social Factors in Forecasting Car Ownership,
Jean M. Hopkin. c1981, 27p TRRL-SUPPLEMENTARY-695
Also pub. as ISSN-0305-1315. Paper presented to the International Conference on Travel Demand Analysis: Activity-Based and Other New Approaches, held at St. Catherine's College, Oxford, 9-11 July 1981.

This report discusses the possible uses of an understanding of the social factors influencing behavior in forecasting car ownership. Official forecasting techniques employed in the UK are described, and the case for change is reviewed. Particular attention is devoted to the potential for developing models which replicate the process of change in car ownership. Some empirical examples in which an understanding of behavior has been applied to car ownership forecasting are considered. These show the reasons why people give up or acquire cars, and demonstrate the data requirements of this kind of research and the types of statement about the future which can be made. It is concluded that the type of model which reproduces actual behavior fully is likely to be too complex and data-intensive to replace more conventional forecasting techniques completely, although some models might be feasible for particular areas or population groups. However the report shows that an understanding of the social factors influencing behavior

can provide valuable background information for enhancing conventional forecasting models and can also suggest the possible structure of alternative forecasting models. (Copyright (c) Crown Copyright 1981.)

PB82-138686 PC **A05**/MF **A01**
Bolt Beranek and Newman, Inc., Cambridge, MA.
Railroad Yard Simulation Model: Description and Computer Program Users' Manual.
Final rept. Sep 78-Feb 81,
L. E. Wittig, C. E. Waldman, and E. K. Bender. Oct 81, 88p BBN-4606, FRA/ORD-81/25.I
Contract DOT-FR-8091
See also PB81-123556.

This report is part of a larger study to identify potentially cost-effective advanced braking and coupling systems. The report describes a model for determining the cost savings in railroad yards that would result from the implementation of advanced braking and coupling systems. First, the operations of a hypothetical composite yard are explained in terms of logic diagrams. These diagrams are reduced to a set of equations, which, in turn, are incorporated into an interactive computer program. Flow diagrams for the program are included. Several example cases are presented that explain how the user determines which variables should be changed, show how he enters this information into the program, and finally, show how he executes the program.

PB82-139494 PC **A03**/MF **A01**
Environmental Protection Agency, Ann Arbor, MI. Test and Evaluation Branch.
Final Results of the 'One Week Follow-Up' with Participants during the FY79 and FY80 Emission Factor Testing Programs.
Technical rept.,
Thomas C. Bejma. Aug 81, 42p EPA-AA-TEB-81-27

This paper describes the results of a follow-up survey with participants during the FY79 and FY80 Emission Factor Testing Programs. The surveys were conducted in the form of a questionnaire which program participants were asked to complete and return, about one week after their vehicle was tested and returned to them. The questions pertained to the efficiency of the lab personnel and the performance of their vehicle after it had been tested. Over 70% of the 2500 questionnaires were completed and returned. The results of both surveys show that practically all participants felt they were treated efficiently by the lab personnel and that the vast majority felt that their vehicle displayed either no change or an improvement in its performance. Of those respondents whose vehicles received maintenance, the percentage that felt that there was an improvement in performance was greater than that of the owners of vehicles which did not receive maintenance. Of the respondents who were not satisfied with the present performance of their vehicles after maintenance, both programs indicate that most felt the same before the maintenance and testing had been performed.

PB82-802596 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Tire Hydroplaning. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 154p
Supersedes PB80-813272, and NTIS/PS-79/0800.

Studies are cited on the interaction of an automotive or aircraft tire with a wet pavement resulting in reduced traction, skidding, or complete loss of contact under certain conditions. The discussions cover the composition and surface characteristics of highway and runway pavements, the acquisition or retention of water films on roads during rainfall, skid resistance and antiskid measures, tread engineering, testing and measuring equipment and methodology, critical speeds, wheel spindown, water depth factors, rolling contact loads, and associated topics. (This updated bibliography contains 146 citations, 8 of which are new entries to the previous edition.)

PB82-859802 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Automobile Tires. April, 1970-1981 (Citations from the Engineering Index Data Base).
Rept. for Apr 70-Dec 81.
Dec 81, 206p
Supersedes PB81-856981.

This bibliography contains citations concerning an analysis of tire deformation, tread deflection measurement, rolling resistance, and the effects of inflation pressure. Tire test automation, endurance testing machines, puncture sealants, tread designs, noise control, material, relationship to automobile fuel economy, and standards are also considered. (This updated bibliography contains 227 citations, 28 of which are new entries to the previous edition.)

13H. Industrial Processes

AD-A106 998/8 PC **A06**/MF **A01**
Eastman Kodak Co., Rochester, NY. Kodak Apparatus Div.
Ultra-Lightweight Mirror Manufacturing and Radiation Response Study.
Final technical rept. 6 Nov 80-31 Mar 81,
T. C. Fitzsimmons, and David A. Crowe. Aug 81, 119p RADC-TR-81-226
Contract F30602-81-C-0008, ARPA Order-3503

This study investigates the requirements for making ultra-lightweight mirrors of Ultra-Low Expansion (ULE) fused silica by frit bonding. It includes a manufacturing assessment of the facilities needed to scale the mirror technology to 4 meters in diameter. It also includes a front surface flux loading thermal test of a .5M diameter frit bonded ULE mirror. The test was supported by detailed modeling and analysis. (author)

AD-A107 128/1 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
Development of Microfabrication Techniques,
Henry I. Smith, Andrew M. Hawryluk, John Melngailis, Stephane S. Dana, and Krikor A. Bezdjian. 1980, 7p
Contracts N00014-79-C-0908, DAAG29-80-C-0104
Pub. in RLE progress Report. No. 123, Section 19 p109-111 Jan 81. Sponsored in part by contracts DAAG29-78-C-0020 and DE-AC02-80-E10179.

No abstract available.

AD-A107 230/5 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Transient Annealing of Arsenic-Implanted Silicon Using a Graphite Strip Heater.
Journal article,
Bor-Yeu Tsaur, John C. Fan, Joseph P. Donnelly, and Michael W. Geis. 19 Mar 81, 4p JA-5227, ESD-TR-81-267
Contract F19628-80-C-0002
Pub. in Applied Physics Letters, v39 n1 p93-95, 1 Jul 81.

No abstract available.

AD-A107 341/0 PC **A04**/MF **A01**
Ohio State Univ. Research Foundation, Columbus.
Optimization of Performance of Arc Welding Using Fluxes in Welded Ship Structures from HY-100 and HY-130 KPSI.
Final rept. 1 Feb 75-31 Dec 78,
Clarence E. Hackson, James T. Hickey, and Michael D. Hayes. Sep 81, 72p
Contract N00014-75-C-0666

The ability to weld steels with yield strengths over 100 ksi with the submerged arc process has been limited by a lack of fluxes and filler metals specifically designed for this purpose. This research program used commercially available filler wires that have been designed for gas metal arc welding and formulated flux compositions to limit the oxygen pickup in the weld metal. The effect of flux basicity on weld metal oxygen content was investigated. Experimental results with approximately 100 heats of fused flux indicated a definite trend of decreasing weld metal oxygen content with increasing flux basicity. In these tests the commercial fluxes produced weld metal with adequate toughness but low yield strength. In mechanical testing, the weld metal produced with experimental fluxes showed good tensile properties with inadequate impact values. The coarse microstructure of the last pass in the welds produced with experimental fluxes appears to be made up of untempered martensite, lower bainite, ferrite and proeutectoid ferrite. It is probable that the cracking observed was solidification cracking and may be related to the high phosphorus content of the weld metal. Additions of vanadium and molybdenum in the electrode or as oxides in the high purity flux may be effective in improving toughness.

N82-11094/1 PC **A02**/MF **A01**
Athens Coll., AL.
Space Processing of Electronic Materials.
Final Report, 27 Jan. - 20 Aug. 1981.
G. L. Workman, and L. R. Holland. 28 Sep 81, 12p
NASA-CR-161892
Contract NAS8-32920

The relative values of thermal conductivity of solid and liquid HgCdTe are critically important in the design configuration of the furnaces used for Bridgman crystal growth. The thermal diffusivity of the material is closely linked to the conductivity by the defining relation D = k/rho c, where D is the diffusivity, K is the thermal conductivity, rho is the density, and c is the specific heat. The use of transient and periodic heating approaches to measure the diffusivity are explored. A system for securing and extracting heat from silica or glass tubes under high C vacuum conditions is described.

PB82-132051 PC **A02**/MF **A01**
Science Research Council, Chilton (England). Rutherford and Appleton Labs.
Control Panels - Layout and Design.
P. J. Alexander. c1981, 18p RL-81-062

These notes contain recommendations for the layout of control panels or control stations, with particular reference to the requirements for the preparation of artwork for the manufacture of panels from the 'Metalphoto' process. (Copyright (c) Science and Engineering Research Council, 1981.)

PB82-133075 PC **A07**/MF **A01**
SRI International, Menlo Park, CA.
Machine Intelligence Research Applied to Industrial Automation.
Rept. no. 8, 1 Aug 77-31 Jul 78,
C. Rosen, D. Nitzan, G. Agin, A. Bavarsky, and G. Gleason. Aug 78, 147p NSF/RA-780918
Grant NSF-APR75-13074
See also PB80-147879.

The main objectives of this study were to explore and develop general-purpose, cost-effective techniques and hardware/software modules for computer controlled systems of manipulators, sensors, and other components that are flexible, adaptable, and easily trained to perform material handling, inspection, and assembly tasks and to transfer this information to industry. Four principal topics were examined: (1) an assembly system in which techniques are developed and demonstrated; (2) computerized visual servoing--involves a vertical bar of light projected on a workpiece to visually servo a manipulator along an edge or a groove of the workpiece; (3) module development--includes an Unimate Manipulator Module, scalar and matrix multipliers, and a Vision Module; and (4) Robot Programming Language (RPL)--an interpreted Fortran-like user language to facilitate the writing and debugging of application programs on a PDP-11/40 minicomputer for material-handling, inspection, and assembly tasks. The appendices include an error analysis of a measured BLOB ;connecting region) centroid; commands for external control of the vision module, and current RPL routines.

PB82-858804 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Sheet Metal Joining: Nonferrous Alloys. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jan 72-Dec 81.
Dec 81, 129p
Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

The bibliography cites reports relating to joint analysis and joining techniques of nonferrous thin plates and sheets. Extensively covered are the aluminum and titanium aerospace alloys. Included also are joining methods for magnesium, beryllium, copper, refractory, and composite alloy sheets and plates. Welding, adhesive bonding, tensile strength testing, fracture mechanics, distortion control, residual stress measurement, and post weld heat treatment of nonferrous

metal plates and sheets are considered. (Contains 125 citations fully indexed and including a title list.)

PB82-858812 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Sheet Metal Joining: Nonferrous Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
Rept. for Jan 66-Dec 81.
Dec 81, 196p

The joining of nonferrous sheet metals by welding, adhesive bonding, riveting, and screwing is discussed in this bibliography from world literature. Light alloy, copper, molybdenum, niobium, and zinc sheet alloys are considered. Structural analysis, residual stress analysis, sheet deformation; control and calculation, heat treatment, and computer controlled testing and inspection of joints in nonferrous sheets are topics included. (Contains 295 citations fully indexed and including a title list.)

PB82-858903 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Sheet Metal Joining: Ferrous Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
Rept. for Jan 66-Dec 81.
Dec 81, 138p

The joining of ferrous alloy sheet metal - carbon steels, stainless steels, HSLA steels, molybdenum and other alloy sheet steels - is discussed in the cited reports. Joint analysis including stress analysis, warpage control, and failure mechanics is considered. Sheet joining techniques included are adhesive bonding, seam, consumable and nonconsumable shielded electrode, and spot welding. The joining of aluminized, galvanized, and plastic coated steel sheets is also discussed. (Contains 212 citations fully indexed and including a title list.)

PB82-858911 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Sheet Metal Joining: Ferrous Alloys. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jan 72-Dec 81.
Dec 81, 146p
Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

The joining of ferrous alloy sheet metal - carbon steels, stainless steels, and high alloy sheet steels - is discussed in the cited reports. Automatic inspection of joint seams using ultrasonic and eddy current methods is included. Localized heat treatment of welded seams in sheet metal is considered. Adhesive and weld bonding methods are discussed. (Contains 150 citations fully indexed and including a title list.)

PB82-858960 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Alloy Electrodeposition. 1970-1981 (Citations from the NTIS Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 108p
Supersedes PB81-852634.

The electrodeposition of alloys is discussed in the cited reports in terms of bath composition and operating conditions. Emphasis is placed on precious and refractory metal alloys as well as wear resistant coatings. The physical properties of the substrate-plated metal are also emphasized. Both aqueous and fused salt electrolyte systems are included. (This updated bibliography contains 92 citations, 36 of which are new entries to the previous edition.)

PB82-859075 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electrodeposition of Copper Base Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
Rept. for Jan 66-Dec 81.
Dec 81, 74p
Supersedes PB81-857302.

The electrodeposition of copper base alloys is discussed in the cited reports. Topics include corrosion protection for electronic applications, mechanical stress of the deposit, and the use of additives to relieve the stress. Plating bath compositions and methods for bath analysis are also included. The effect of the substrate on the properties of the electroplate is also discussed. (This updated bibliography contains 99 citations, 10 of which are new entries to the previous edition.)

PB82-859083 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Magnetic Separation of Materials. June, 1976-1981 (Citations from the Energy Data Base).
Rept. for Jun 76-Dec 81.
Dec 81, 256p
Supersedes PB81-855249. Prepared in cooperation with the Department of Energy, Washington, DC.

The use of high strength magnets for material separation is discussed in the cited reports. Major emphasis is placed on the separation of magnetic materials from coal; however, magnetic separation is also discussed in terms of waste water treatment, desulfurization of minerals, and the recovery of iron oxide from flyash. In addition, magnetic separation is applied to recycling and processing of solid waste. (This updated bibliography contains 234 citations, 109 of which are new entries to the previous edition.)

PB82-859208 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Plasma Etching Technology and Applications. 1970-1981 (Citations from the Searchable Physics Information Notices Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 88p
Supersedes PB81-858128.

Citations in this bibliography cover plasma etching techniques, technology, and applications to a wide variety of materials and surfaces. Considered are endpoint detection, plasma mechanisms, magnetic field control of reactive plasma, and plasma flow-rate dependencies and effects. (This updated bibliography contains 78 citations, 18 of which are new entries to the previous edition.)

PB82-859299 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Anodizing Aluminum. 1974-1981 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jan 74-Dec 81.
Dec 81, 79p
Supersedes PB80-851165. Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography cites reports relating to the physical properties and application methods of anodic coatings on aluminum. The influence of the anodic coating on fatigue, and the inspection of aluminum by studies of coating flaws and failure, are included. The various anodizing processes are considered in terms of adhesive bond strength. Non-tank phosphoric acid, molten salt, and chromic acid anodizing processes are included. The resistance of anodized aluminum to humidity and corrosion is also discussed. (This updated bibliography contains 70 citations, 18 of which are new entries to the previous edition.)

PB82-859356 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Rapid Quenching of Metals. 1971-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 71-Dec 81.
Dec 81, 114p

This bibliography covers studies on the techniques for, and properties of, rapidly-quenched and splat-quenched ferrous and nonferrous metals. Excluded are references to forming or pressing of the metals after being rapidly quenched. The citations include references to metallographic studies on various physical properties. Magnetic properties, conductivity, structure, and constituent phases are included. Rapid quenching is a technique to allow the preparation of alloys to meet specialized requirements for homogeneity, solubility, hardness, strength and corrosion resistance, as well as providing a means to study phase transformations. (Contains 117 citations fully indexed and including a title list.)

PB82-859760 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electroplating of Copper. 1976-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 162p
Supersedes PB81-856304.

The electroplating of copper is discussed in the cited reports in terms of the nature of the substrate and the operating parameters such as current density and temperature. Plating bath compositions and problems associated with disposal of plating waste are also considered. Applications such as printed circuit contacts and solar cell arrays are included. (This updated bibliography contains 171 citations, 17 of which are new entries to the previous edition.)

PB82-859778 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electroplating of Copper. 1970-1981 (Citations from the NTIS Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 134p
Supersedes PB81-856288.

The electroplating of copper is discussed in the cited reports. The use of plated copper in solar cells and associated heat exchangers is emphasized. The mechanical properties of thin copper films are discussed in terms of deposit stress and adherence. The electrodeposition of copper on non-metallic surfaces is also considered. Problems associated with corrosive plating bath electrolytes and the disposal of plating waste are also discussed. (This updated bibliography contains 109 citations, 29 of which are new entries to the previous edition.)

PB82-859786 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electroplating of Chromium. 1970-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 87p
Supersedes PB81-856338.

The electroplating of chromium is discussed in the cited reports. The operation of plating baths and the treatment of plating wastes are featured. Factors affecting the nature of the plate such as current density and bath composition are also discussed, and the wear and corrosion characteristics of the plate are also mentioned. (This updated bibliography contains 90 citations, 11 of which are new entries to the previous edition.)

PB82-859794 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electroplating of Chromium. 1970-1981 (Citations from the NTIS Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 129p
Supersedes PB81-856320.

The electroplating of chromium is duscussed. Topics include black chromium for solar absorbers as well as low cost contacts to silicon cells. Automated plating processes for parts such as gun barrels are included, as is the plating of parts for wear resistance. The effects of chromium plated parts on metal stress and fatigue are also discussed. Particular emphasis is placed on the treatment of plating waste and metal recovery. (This updated bibliography contains 94 citations, 25 of which are new entries to the previous edition.)

PB82-859919 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electrodeposition of Cobalt Base Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
Rept. for Jan 66-Dec 81.
Dec 81, 81p
Supersedes PB81-857294.

The electrodeposition of cobalt base alloys is discussed in the cited reports. Factors affecting the substrate/deposit combination include bath composition, operating parameters, impurities, and bath additives. Emphasis is placed on the magnetic properties of the

deposit as well as residual stress. The corrosion resistance of the deposit is also discussed. (This updated bibliography contains 117 citations, 10 of which are new entries to the previous edition.)

PB82-859927 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electrodeposition of Nickel Base Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
Rept. for Jan 66-Dec 81.
Dec 81, 154p
Supersedes PB81-857336.

The electrodeposition of nickel base alloys is discussed in the cited reports, in terms of the nature of the deposit-substrate combination. Emphasis is placed on stress effects and crystal structure as well as wear and corrosion resistance. Plating bath compositions and operating condition are also included. (This updated bibliography contains 238 citations, 20 of which are new entries to the previous edition.)

13I. Machinery and Tools

AD-A107 387/3 PC **A02**/MF **A01**
Columbia Univ., New York.
An Integrated Approach to the Optimization of High-Speed Cam-Follower Systems.
Final technical rept.,
Ferdinand Freudenstein. 15 Sep 81, 5p ARO-12953.7-E, ARO-15911.2-E
Contract DAAG29-80-C-0135, Grant DAAG29-78-G-0176

Research has resulted in basic measurements on the dynamic response of a modern, high-speed cam-follower systems; the development of a predictive dynamic model for the dynamic response of high-speed cam-follower systems, both for normal behavior and the onset of toss, bounce and spring surges; and the application of optimal-control theory to the optimization of cam-follower systems in the design stage. (Author)

LA-UR-80-621 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Design Analysis for the Control and Drive Retrofit of a Numerically Controlled Lathe.
S. L. Cotter. 1980, 10p CONF-800606-1
Contract W-7405-ENG-36
Symposium on incremental motion control systems and devices, Champaign, IL, USA, 2 Jun 1980.

A system approach to the retrofit of a numerically controlled two-axis lathe was taken to identify component function and interrelation. The dynamic system of the motor and machine was modeled and parameter identification experiments were done. This model, in state equation form, was used with the parameters data as the basis of a digital simulation of the system. From this and further analysis of the control characteristics, recommendations for component selection were presented. (ERA citation 05:022775)

PAT-APPL-6-297 486 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
Gas Levitator and Method for Containerless Processing.
Patent Application,
L. H. Berge, W. A. Oran, and J. M. Theiss. Filed 28 Aug 81, 17p N82-10359/9, NASA-CASE-MFS-25509-1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

An elongated levitation tube having a contoured interior in the form of a convergent section, and a constriction and divergent section, wherein the levitation node is created, is described. Gas flow control means control flow to prevent separation of flow from the interior walls in the region of specimen. An apparatus provides for levitating and heating the specimen simultaneously by combustion of a suitable gas mixture combined with an inert gas.

PB82-136011 PC **A03**/MF **A01**
University of Manchester Inst. of Science and Technology (England). Control Systems Centre.
Compensation of the Speed Governor of a Water Turbine by the Method of Inequalities,
Carlos Alberto Dias Coelho. Jan 79, 29p CONTROL SYSTEMS CENTRE-440

The method of inequalities is used to design a compensator for the speed regulation of a Francis water turbine. Apart from the improvement in regulation achieved, this paper provides a partial evaluation of the potentialities of this method of design.

PB82-140211 PC **A03**/MF **A01**
Centre Technique des Industries Mecaniques, Senlis (France).
Monitoring of Machines,
M. Gaillochet. 1981, 44p CETIM-15-J-041-PT-2
Trans. of mono. Surveillance des Machines, n.p., n.d. See also French version N81-24480/8.

The application of classical vibration analysis to the surveillance of the mechanical condition of machines is described. Automated procedures handled by specialized computers, using advanced signal processing techniques, are sought. Vibration measurement and analysis are reviewed, covering sensors and recorders, frequency analyzers, and methods for visualization results. Existing procedures for monitoring machine wear are touched on. A method for determining vibration signatures is proposed. As an example, the vibrations generated by reduction box elements are characterized. A low frequency Fourier analysis is performed. The individual signatures of the gear wheels are identified. A statistical analysis of the global signal is then given. The implications of vibration analysis as a maintenance tool are brought out, emphasizing the advantages to be accrued through automation of wear diagnostics.

13J. Marine Engineering

AD-A106 949/1 PC **A06**/MF **A01**
Institute for Defense Analyses, Arlington, VA. Program Analysis Div.
Planning Amphibious Lift Forces. Appendix. Amphibious Ship Capacity Handbook.
Final rept.,
Erwin C. Allen, William A. Byrne, Michael L. Plitman, and Martin B. Betts. Apr 81, 115p IDA-P-1541-APP, IDA/HQ-80-23003, AD-E500 414
Contract MDA903-79-C-0320
Appendix to AD-C026 422. Prepared in cooperation with Presearch, Inc.

Alternative loadings are presented for nine different types of amphibious lift ships. For each type of ship, the loadings vary in their allocation of space to types of cargo. The basic source document is the Ship Loading Characteristics Pamphlet (SLCP).

AD-A106 987/1 PC **A99**/MF **A01**
Ship Building Research Association of Japan, Tokyo.
Proceedings of the Thirteenth Symposium on Naval Hydrodynamics Held at Tokyo (Japan) on October 6-10 1980,
Takan Inui. 1981, 882p

The technical program for the Symposium was constructed around the core theme of 'the impact of hydrodynamics theory upon design practice with emphasis on high performance and/or energy saving ships,' and consisted of three sessions on Hull Form, two on Viscous Flow and one each on Propulsion, Cavitation and WAve Energy. The authors of the forty-five papers which were presented were drawn from the international community of ship hydrodynamics research scientists with fourteen nationalities represented on the technical program. (Author)

AD-A107 236/2 PC **A03**/MF **A01**
Cincinnati Univ., OH. Dept. of Mechanical and Industrial Engineering.
User's Manual for UCIN-CABLE: Underwater Cables.
Technical rept. 15 Apr 80-15 Oct 81,
James W. Kamman, and Ronald L. Huston. 15 Oct 81, 43p Rept no. UC-MIE-1015181-1C-ONR
Contract N00014-76-C-0139

This report presents a computer program, UCIN-CABLE: Underwater Cables. The program is designed to study the dynamics of underwater cables. The cable is modeled as a series of rigid cylinders connected end-to-end by ball and socket joints. There may be one or many branches, and no closed loops are formed. The effects of normal fluid drag, tangential fluid drag, added mass, and buoyancy are included. This manual provides detailed instructions and building a set of input data and interpreting the output of the program. (Author)

AD-A107 366/7 PC **A12**/MF **A01**
Kearney (A.T.), Inc., Chicago, IL.
National Waterways Study Overview of the Transportation Industry.
Final rept. Jan 79-81,
Victor Churchward, and Edwin Isely. Aug 81, 251p
Contract DACW72-79-C-0003

This NWS report, Overview of the Transportation Industry, is a review of the transportation carriers and ports and terminal industries. A profile of the transportation industry is presented, in addition to a review of the outlook, problems and impacts that other surface modes are likely to have on the waterways industry. This report focuses on specific issues of the waterway transportation industry as well as key issues related to rail, truck, and pipeline transportation. The primary purposes of this report are to provide the transportation perspective to issues and factors which affect the commodity flow analysis; provide a current understanding of transportation operations and equipment utilization; and provide insight and understanding of transportation issues for the scenario development and evaluation of alternative strategies for managing the waterway system. (Author)

AD-A107 500/1 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Procurement, Logistics, and Readiness Div.
Logistics Concerns over Navy's Guided Missile Frigate FFG-Class.
7 Jul 81, 62p Rept no. GAO/PLRD-81-34
Report to the Congress.

The Navy has developed many logistics strategies for the FFG-7 class ships, which differ significantly from traditional practices in the surface Navy. It wants to reduce the number of shipboard personnel needed and increase ship availability. Questions remain, however, as to whether this will provide adequate and economical logistics support for the FFG-7s. This report raises a number of issues about the feasibility and economy of the new logistics strategies and recommends actions to improve support.

PB82-802844 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Surface Effect Vehicles/Ships in Marine Environments. 1970-November, 1981 (Citations from the Engineering Index Data Base).
Dec 81, 216p
Supersedes PB80-814510, and NTIS/PS-79/0937.

Surface effect ships and vehicles and their aerodynamic characteristics are investigated in these research reports gathered from worldwide literature surveys. Technical and operational characteristics are reviewed. (This updated bibliography contains 212 citations, 10 of which are new entries to the previous edition.)

PB82-802851 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Surface Effect Vehicles/Ships in Marine Environments. 1964-November, 1981 (Citations from the NTIS Data Base).
Dec 81, 267p
Supersedes PB80-814528, and NTIS/PS-79/0936.

Surface effect ships and vehicles and their aerodynamic characteristics are investigated in these Government-sponsored research reports. Technical and operational characteristics are reviewed. (This updated bibliography contains 259 citations, 8 of which are new entries to the previous edition.)

PB82-859893 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.

Marine Gas Turbine Engines. 1973-1981 (Citations from Information Services in Mechanical Engineering Data Base).
Rept. for Jan 73-Dec 81.
Dec 81, 116p
Prepared in cooperation with Cambridge Scientific Abstracts, Washington, DC.

Topics in this bibliography include the development and operation of marine gas turbine engines. Corrosion resistant coatings for gas turbine parts, design innovations relative to material advances in turbine blades for marine exposure, gas turbine generating sets, exhaust emissions from gas turbine combuster, and applications for gas turbine power plants in the marine environment are among the considerations in this bibliography. Performance tests of presently operating marine gas turbines manufactured by various producers are included. (Contains 155 citations fully indexed and including a title list.)

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

N82-11465/3 PC **A05**/MF **A01**
Rockwell International, Canoga Park, CA. Rocketdyne Div.
Advanced Superposition Methods for High Speed Turbopump Vibration Analysis.
Interim Report.
C. E. Nielson, and A. D. Campany. 19 May 81, 96p
NASA-CR-165379, RI/RD81-149
Contract NAS3-22480

The small, high pressure Mark 48 liquid hydrogen turbopump was analyzed and dynamically tested to determine the cause of high speed vibration at an operating speed of 92,400 rpm. This approaches the design point operating speed of 95,000 rpm. The initial dynamic analysis in the design stage and subsequent further analysis of the rotor only dynamics failed to predict the vibration characteristics found during testing. An advanced procedure for dynamics analysis was used in this investigation. The procedure involves developing accurate dynamic models of the rotor assembly and casing assembly by finite element analysis. The dynamically instrumented assemblies are independently rap tested to verify the analytical models. The verified models are then combined by modal superposition techniques to develop a completed turbopump model where dynamic characteristics are determined. The results of the dynamic testing and analysis obtained are presented and methods of moving the high speed vibration characteristics to speeds above the operating range are recommended. Recommendations for use of these advanced dynamic analysis procedures during initial design phases are given.

N82-11468/7 PC **A12**/MF **A01**
Rockwell International, Canoga Park, CA. Rocketdyne Div.
Liquid Oxygen Turbopump Technology.
Final Report.
C. E. Nielson. Nov 81, 252p NASA-CR-165487, RI/RD81-199
Contract NAS3-21356

A small, high-pressure, LOX turbopump was designed, fabricated and tested. The pump is a single-stage centrifugal type with power to the pump supplied by a single-stage partial-admission axial-impulse turbine. Design conditions included an operating speed of 7330 rad/s (70,000 rpm), pump discharge pressure of 2977 N/sqcm (4318 psia), and a pump flowrate of 16.4 Kg/s (36.21 lb/s). The turbopump contains a self-compensating axial thrust balance piston to eliminate axial thrust loads on the bearings during steady-state operation. Testing of the turbopump was achieved usng a gaseous hydrogen high-pressure flow to drive the turbine, which generally is propolled by LOX/LH2 combustion products, at 1041K (1874 R) inlet temperature and at a design pressure ratio of 1.424. Test data obtained with the turbopump are presented which include head-flow-efficiency performance, suction performance, balance piston performance and LOX seal performance. Mechanical performance of the turbopump is also discussed.

PAT-APPL-6-308 203 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
Improved Constant-Output Atomizer.
Patent Application,
J. Y. Dea. Filed 2 Oct 81, 12p N82-10360/7, NASA-CASE-MFS-25631-1
Sponsored by NASA.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A constant-output atomizer is described which includes a generally frustoconical expansion nozzle for producing an air jet. A liquid feed line supplies liquid to be atomized by the air jet, and the body includes a groove which opens into the diffuser section of the nozzle downstream of the throat for conducting liquid from the feed line to the nozzle. The groove extends in a direction perpendicular radially to the axis of the nozzle, and it has a depth approximately equal to half the axial length of the nozzle. Liquid, conducted by capillary action in the groove to the nozzle, is atomized into a fine mist by the air jet in the nozzle; and the groove eliminates fluctuations in spray order.

13L. Safety Engineering

AD-A107 282/6 PC **A02**/MF **A01**
Desmatics, Inc., State College, PA.
Statistical Research on Problems Associated with Navy Fire Protection and Fuel Technology Programs.
Final rept.,
Dennis E. Smith. Oct 81, 15p Rept no. TR-109-1
Contract N00014-77-C-0661

This final technical report summarizes a study which has been devoted to statistical research in a number of problem areas associated with Navy fire protection and fuel technology programs. The report reviews the research areas considered and provides a list of informal technical notes prepared under this contract.

N82-11278/0 PC **A02**/MF **A01**
South African Bureau of Standards, Pretoria.
Standard Specification for Industrial Safety-Belt Assemblies.
5 Nov 80, 20p SABS-809-1980, ISBN-0-626-05710-8
In English and Afrikaans.

Specifications are given for the general design, material, construction, and performance requirements for four types of industrial safety belts: (1) a waist belt; (2) a combination of a waist belt and shoulder, 11 leg, and back straps; (3) a combination of a waist belt and shoulder and back straps. Inspection procedures and test sequences are included with drawings.

N82-11311/9 PC **A05**/MF **A01**
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
Firefighting Module Development.
R. A. Burns. Oct 81, 76p NASA-TM-82444

The firefighting module is a lightweight, compact, self contained, helicopter-transportable unit for fighting harbor and other specialty fires as well as for use in emergency water pumping applications. Units were fabricated and tested. A production type unit is undergoing an inservice evaluation and demonstration program at the port of St Louis. The primary purpose is to promote enhanced harbor fire protection at inland and coastal ports. The module and its development are described.

PB82-128653 PC **A04**/MF **A01**
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
Windshield Damage and Driving Safety.
Final rept. Jul 80-Jun 81,
Paul Green, and William T. Burgess. Jun 81, 66p
UM-HSRI-81-35
Sponsored in part by Auto Glass Industry Committee for Highway Safety, Washington, DC.

In a two-choice response time experiment, drivers viewed slides of nighttime road scenes through four different windshields. Drivers were asked to indicate if it was 'safe to proceed' by pressing buttons. Increasing the degree of windshield damage led to increases in response time, especially when a light simulating the glare of an oncoming vehicle's headlamps was present. This last result suggests to the authors that windshield damage is a visibility problem that should receive more attention from drivers and safety organizations.

PB82-135328 PC **A02**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Yellow Bar Experimental Carriageway Markings - Accident Study,
R. D. Helliar-Symons. c1981, 22p TRRL-LR-1010
Also pub. as ISSN-0305-1293.

Analysis of accidents at 42 roundabouts at which Yellow Bar experimental carriageway markings had been laid on an approach road, showed an overall reduction in the proportion of speed-related accidents on these approach roads of 57 per cent. The markings appeared to be most effective in reducing fatal and serious injury accidents, while still reducing slight injury accidents. They were more effective in daylight than after dark and appeared to be most effective when the road surface was wet, rather than dry. They were highly cost-beneficial and the accident reduction was maintained at seven pilot sites for which data for four years after installation were available. (Copyright (c) Crown Copyright 1981.)

PB82-135450 PC **A05**/MF **A01**
Bureau of Mines, Pittsburgh, PA. Pittsburgh Research Center.
Mines Safety Education and Training Seminar. Proceedings: Bureau of Mines Technology Transfer Seminars, Pittsburgh, PA., Dec. 9, 1980, Springfield, IL., Dec. 12, 1980, and Reno, NV., Dec. 16, 1980.
Information circular.
Oct 81, 82p BUMINES-IC-8858

Research personnel from the Bureau of Mines, a representative of the Mine Safety and Health Administration, and research contractors for the Bureau of Mines met with other Government and industry representatives at three seminar locations in December 1980 to discuss the findings and products of Bureau research on mine safety training. The research program is aimed at providing assistance to the mining community in its efforts to reduce industrial-type, human-error accidents through research establishing performance based methods and media for employee training. Research emphasis is directed toward development of baseline materials and instructional models; development of methods for structuring and evaluating health and safety, supervisory, and occupational training; and the continued investigation and applicition of current learning and simulation technology that could significantly enhance the effectiveness of training opportunities.

PB82-857533 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Dust Explosions: Combustibles and Extinguishment. 1978-1981 (Citations from the Fire Technology Abstracts Data Base).
Rept. for Jan 78-Dec 81.
Dec 81, 60p
Prepared in cooperation with the Federal Emergency Management Agency, Washington, DC.

Topics in this bibliography include flammability and combustibility of dust concentrations in working areas. Coal dusts, metal powders, wood dust, lacquer dust from sanding finished surfaces, grain dusts, and cork dust are among the materials tested for combustible tendencies. Hazards of explosive dusts, measures to reduce the risks of dust explosions in industry, and extinguishing agents effective against dust fires are included. (Contains 62 citations fully indexed and including a title list.)

PB82-858929 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Pulp/Paper Mill Dust Fires. 1974-1981 (Citations from the Institute of Paper Chemistry Data Base).
Rept. for Jan 74-Dec 81.
Dec 81, 98p

This bibliography contains citations concerned with dust generation processes in the pulp/paper industry relative to creating dust fires and explosions. Dust concentrations of the exhaust gases of kraft pulp black liquor production, dust build-ups in boiler stacks, dust accumulation in machine air purification systems, cork dust and moisture content, and dust generated from the production of cellulosic fiber insulation are among the topics discussed relative to explosive dust accumulations contributing to hazardous work conditions. Preventive measures and industrial process modifications are included with reference to controlling dust generated fire conditions. (Contains 69 citations fully indexed and including a title list.)

13M. Structural Engineering

AD-A107 095/2 PC **A04**/MF **A01**
Dayton Univ., OH. Research Inst.
Finite Element Techniques for Static Stress and Free Vibration Analysis of Sandwich Composites.
Final rept. Sep 77-Nov 80,
Robert A. Brockman. Mar 81, 63p UDR-TR-80-134, AFWAL-TR-81-3007
Contract F33615-77-C-3075

Finite element solution techniques for stress and vibration analysis of layered sandwich panels are presented. The modeling approach considers each layer of the sandwich explicitly and can treat panels involving discrete stiffeners of two types. Static analyses of general sandwich panels can include mechanical and/or thermally-induced forces. Free vibration analysis is also considered. The associated computer program is suitable for operation at an interactive terminal, and includes provisions for automatic mesh generation and tabular output. Generated input and output data are in a form which may be accessed by existing computer graphics programs for plotting geometry and results. Sample analyses are presented to demonstrate the developed techniques. (Author)

AD-A107 096/0 PC **A04**/MF **A01**
Dayton Univ., OH. Research Inst.
Minimum Weight Design of Flat Sandwich Panels under Edgewise Compression Loads.
Final rept. Sep 77-Nov 80,
Fred K. Bogner, and M. L. Soni. Mar 81, 56p UDR-TR-80-119, AFWAL-TR-81-3009
Contract F33615-77-C-3075

An approach to the optimum design of flat, rectangular sandwich panels subjected to edgewise compression loading has been developed. Using a nonlinear programming method called the Sequential Unconstrained Minimization Technique, the design parameters characteristic of sandwich construction are determined so that the final panel configuration is not just an acceptable design, but is the best acceptable design as far as total panel weight is concerned. The design parameters are the individual thicknesses of the top and bottom face sheets and of the core, the cell size and foil thickness of honeycomb core, and the density of foam core. The acceptable ranges of the design parameters are limited by constraints which ensure, for example, that the thicknesses are within minimum and maximum limits, that the faces do not yield, wrinkle, or dimple, and that the panel does not buckle. Possible panel loads are edgewise compression in two directions.

AD-A107 131/5 PC **A03**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
Cold Regions Testing of an Air-Transportable Shelter,
Stephen N. Flanders. Aug 81, 28p Rept no. CRREL-81-16

An air-transportable shelter designed and built at CRREL for use in cold regions underwent testing in Hanover, New Hampshire, and Ft. Greely, Alaska. The shelter demonstrated some of its capabilities for mobility by being towed for more than 60 miles behind various vehicles and by being transported on a C-130 cargo airplane, a CH-47 helicopter, and a trailer truck. The shelter proved to be very easy for a crew of two to four to set up in all weather conditions including -40 F cold. However, the gasoline-powered generator, which was a source for space heat as well as electricity, functioned very poorly. Overall, the prototype successfully demonstrated qualities of self-reliance, ease of operation and thermal efficiency. (Author)

LBL-8822 PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
New Measurement Strategy for in Situ Testing of Wall Thermal Performance.
P. E. Condon, W. L. Carroll, and R. C. Sonderegger. Jun 80, 42p CONF-791233-6, EEB-ENV-79-3
Contract W-7405-ENG-48
Conference on thermal performance of the exterior envelopes of buildings, Orlando, FL, USA, 3 Dec 1979.

A new device is proposed for measuring the thermal resistance and the dynamic thermal response of building walls in either the laboratory or the field. The primary departures from past approaches are the control of the time-dependent surface heat fluxes on the specimen and the determination of the surface temperatures as dependent variables. The performance characteristics of the device are analyzed by the use of complex thermal admittance. A prototype is being developed based on this analysis. The apparatus is portable and has sophisticated on-line computer control and data analysis through the use of a microprocessor. (ERA citation 05:032439)

PB82-133984 Not available NTIS
National Bureau of Standards, Washington, DC.
Air Exchange Measurements in a High Rise Office Building.
Final rept.,
C. M. Hunt, and S. J. Treado. 1981, 18p
Pub. in Proceedings of ASHRAE/DOE/ORNL Conference on Thermal Performance of Exterior Envelope of Buildings, Orlando, Florida, December 3-5, 1979, ASHRAE SP 28, p160-177 1981.

Air exchange rates were measured in the tower of an 11-story office building using SF6 as a tracer gas. Fall and winter air exchange rates, I (hr to the minus 1), measured with make-up and main exhaust pathways blocked, could be represented as a function of wind spread, W (mi/hr), by the equation I = 1.08 + 0.036W - 0.0005W squared, sigma = 0.15. Wind direction and temperature difference (stack effect) exerted little effect on air exchange rate. In this building, toilet exhausts and other weather-independent mechanisms were more important than natural infiltration in producing air exchange. Inside-outside pressure difference measurements were monitored as a function of temperature and wind speed. Also, a preliminary analysis of predicted air infiltration by the Shaw-Tamura model was undertaken. The results of this preliminary analysis were consistent with the observations that the stack effect was unimportant and that natural infiltration contributed only part of the total air exchange. However, the plot of calculated infiltration rate as a function of wind speed, using the Shaw-Tamura model, had a different form than the plot of measured data.

PB82-134081 PC **A06**/MF **A01**
Bolt Beranek and Newman, Inc., Cambridge, MA.
Model Noise Control Provisions for Building Codes and an Implementation Manual,
A. S. Harris, D. S. Keast, N. P. Miller, and T. J. Schultz. Aug 81, 105p EPA-550/9-81-401

A model municipal noise control code for buildings has been developed. Also included is an implementation manual for this code. The provisions of the code were developed with three objectives in mind. First, they attempt to minimize the adverse health and welfare effects of intruding noise without requiring the construction of economically unreasonable buildings. Proposed standards for the outdoor reduction of noise levels are achievable with existing materials and construction techniques. Secondly, enforcement for the review of plans and for the acceptance of completed buildings are described. Thirdly, this material should help jurisdictions develop a process of administration and enforcement that is compatible with existing building code procedures. The model provisions of the proposed building code contain performance standards. These standards are administered and enforced by review of plans and inspections during and after construction of buildings.

PB82-135377 PC **A03**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Probabilistic Analysis of Seismic Response of Multi-Supported Structures on Soft Soils (Analisis Probabilistico de la Respuesta Sismica de Estructuras Sobre Varios Apoyos en Suelos Blandos),
Sonia Ruiz, and Luis Esteva. Dec 80, 39p 432
Text in Spanish.

A probabilistic analysis criterion is presented to estimate seismic response of multi-supported structures on soft soil subjected to out-of-phase ground motion. The criterion is based on the proportionality between the design response and the standard deviations of that response. The ground motion is represented as the product of a stationary gaussian stochastic process and a deterministic intensity function of time. As an example the expected maximum relative displacements of a multi-supported bridge with piles embedded in a soft clay stratum subjected to SV seismic waves were computed.

PB82-135385 PC **A09**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Design of Concrete Walls with Shear Failure (Diseno de Muros de Concreto Con Falla Por Cortante),
Oscar Hernandex Basilio. Dec 80, 178p 433
Text in Spanish.

As a result of an experimental program the hysteretic behavior of concrete walls with shear failure is discussed and a method for the prediction of shear wall strength is proposed. The method takes into account several variables whose effect had not been sufficiently studied. Calculated strength is compared with the results of shear wall tests carried out in different research programs and an excellent approximation is found. Also, step by step analyses under actual earthquakes were carried out in order to show the behavior of the model which described the hysteresis loops under lateral loads of concrete walls under high shear forces.

PB82-135609 PC **A02**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Single-Room Heat Balance for Building Heat Transfer,
Bradley A. Peavy. Nov 81, 21p NBSIR-81-2321
Sponsored in part by Department of Energy, Washington, DC.

A single-room heat balance has been developed to provide a more precise computational tool. The primary purpose for this tool is to evaluate the effects of approximations presently used in computer programs on the determination for building heating and cooling loads. Specific algorithms to be incorporated in the room heat balance concern radiosity shape factors, temperature difference dependent convection heat transfer coefficients, simulated room mass, and an iterative methodology for solution of room temperatures.

PB82-136284 PC **A03**/MF **A01**
National Bureau of Standards, Washington, DC.
Documentation of Program for Determination of Conduction Transfer Functions,
Bradley A. Peavy. Nov 81, 50p NBSIR-81-2353

Conduction transfer functions are used to predict the time-dependent one-dimensional conduction heat transfer at surfaces of single- or multi-layer building constructions based on heat flux and temperature history at each surface. By the use of conduction transfer functions, heat transfer problems employing nonlinear boundary conditions such as thermal radiation and time-dependent changes in the surface film resistances can be solved. Because conduction transfer functions are analytically derived with an initial time condition of zero temperature potential throughout the solid materials, it becomes necessary to initialize the computation by including exposure to a number of outdoor weather cycles such that satisfactory initial conditions of temperature and heat flux exist at the inside and outside surfaces. The program is set up for the use of 1-, 2-, or 3-hour time intervals, depending on the thickness of the building construction. The program allows for the combination of two building constructions, e.g., the parallel heat flow paths found in wood-frame walls.

PB82-141110 PC **A05**/MF **A01**
Institute of Gas Technology, Chicago, IL.

Development and Field Verification of a Model of House Air Infiltration for Single Family Residences.
Final rept. Jul 80-Jun 81,
James T. Cole, John A. Kinast, Thomas S. Zawacki, Robert H. Elkins, and Robert A. Macriss. Jul 81, 79p GRI-80/0082
Contract GRI-5080-341-0320

An air infiltration computer program, developed earlier, has been further refined by the inclusion of the effects of door openings and vent-fan usage on house air infiltration. The model has also been further verified for its accuracy and precision by comparison to actual air infiltration data from both 'conventional' construction dwellings and also from two 'advance' design homes. A program listing and user manual of the computer program have also been developed. A simplified computer program has been developed for the use of the model to estimate house air infiltration by means of a hand-held programmable calculator. Also, a rigorous air infiltration-load computer program, has been developed capable of integration into existing programs for building energy calculations, such as E-Cube, NBS-LD, DOE-2, etc.

PB82-144437 PC **A06**/MF **A01**
Delphi Research Associates, Washington, DC.
Proceedings of the U.S.-U.S.S.R. Joint Seminar on Building Electrical, Plumbing, and Heating/Ventilating/Air Conditioning Systems.
Aug 79, 121p HUD-0002035
Contract HUD-H-5180
Sponsored in part by National Research Council, Washington, DC. Building Research Advisory Board.

This volume contains the proceedings of a joint seminar attended by representatives of the United States and the USSR, on building electrical, plumbing, and heating / ventilating / air conditioning systems. Full texts of six papers and accompanying discussions from the bilateral working group on internal utilities are presented. This state - of - the - art material is intended to serve as a foundation for further study under technical information exchange agreements as well as a resource for American specialists working in the research and application of improved utilities technology. Papers presented by U.S. representatives focus on the current practice for design and installation of building electrical systems; conservation of water in buildings; and design, fabrication, and control of heating / ventilating / air conditioning systems. Representatives of the Soviet Union presented papers on building sewage systems, single - pipe heating and potable water supply systems, and physical modeling of ventilating and air conditioning systems. Photographs, graphic illustrations, and tabular data are included.

PB82-144601 PC **A05**/MF **A01**
Forest Products Lab., Madison, WI.
Fire Endurance Under Design Load for Walls of One-Story Three-Room Structures of Sandwich and Wood-Frame Construction,
Herbert W. Eickner, Carlton A. Holmes, John J. Brenden, Curtis C. Peters, and Robert H. White. Feb 81, 92p HUD-0002069

Large - scale fire tests were conducted on seven wooden structures to examine the actual endurance times of structural sandwich walls in housing under design loads when exposed to interior fires and to compare endurance times with those for conventional wood - frame structures. Additional study goals were to determine the influence of interior thermal protection and to correlate performances to laboratory results. The seven structures were 16 feet by 24 feet. Four of the structures were of sandwich construction with cores of plastic or paper honeycomb, and three structures were of wood - frame construction. The walls were loaded to a computed design loading. Fire endurance was determined under a fire exposure from a typical building contents loading of 4.5 pounds per square foot of floor area. Two open windows at each end of each structure were wized to obtain a ventilation - controlled fire during the fully developed test. the tests confirmed the poor fire endurance performance of the unprotected sandwich construction as previously indicated by laboratory tests. Interior thermal protection in the form of gypsum wallboard improved the performance of sandwich and wood - frame walls. For fire endurance, conventional wood - frame construction appeared to be better than load - bearing sandwich panels with plywood faces. The tests also showed that 640 degrees was a critical temperature associated with flashover under the fire conditions used. During the early stages of some of the structure tests, the optical density of the fire atmosphere seemed to vary linearly with time. Chemical analysis showed little evidence of hydrogen cyanide accumulation, although this compound could be a degradation product of some of the sandwich panels. The carbon monoxide and carbon dioxide concentrations were consistent with the test structures' geometry, outside weather conditions, and overall stage of fire growth at the time of measurement. A reference list and an appendix presenting photographs, figures, and tables with study results are provided. (Author abstract modified).

PB82-146341 PC **A11**/MF **A01**
National Research Council, Washington, DC.
New Approaches to Evaluating Firesafety in Buildings: Proceedings of a Conference, September 20-21, 1978, Washington, DC.
Symposium-workshop rept. no. 5.
Jul 80, 248p ISBN-0-309-03089-7
Contract EO-A01-78-00-3531
Library of Congress catalog card no. 80-52473.

A conference was organized on 'New Approaches to Evaluating Firesafety in Building', with the joint sponsorship of the National Fire Prevention and Control Administration and the Construction Research Council, to provide a broad audience representative of the building community with a better understanding of the developmental status of systems approaches and their application to firesafety. The purpose of this report is to present the proceedings of the conference. The first portion of the two day conference was devoted to description of the four basic approaches to the systems concept that have been or are being developed and their actual application. These papers are presented in Part I of this report. During the second portion of the conference, the potential impact of systems applications was discussed. Five panels composed of representatives of those groups that would be most affected by such applications (i.e., owners and managers, designers, insurers, codes and standards groups, and educators and trainers) led the discussion and the presentations of these panelists are presented in Part II of this report. A list of those participating in the conference is presented in the Appendix.

PB82-802349 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Industrialized Housing, 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 232p
Supersedes PB80-814486, and NTIS/PS-79/0943.

Abstracts relevant to construction materials, environment testing, costs, and construction guidelines for industrialized building are cited. Much of the research was generated by the Department of Housing and Urban Development (HUD) and its Breakthrough Operation. Prefabrication techniques employed by numerous foreign countries are reviewed. (This updated bibliography contains 224 citations, 6 of which are new entries to the previous edition.)

PB82-857939 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Port and Harbor Safety, 1974-1981 (Citations from Oceanic Abstracts).
Rept. for Jan 74-Dec 81.
Dec 81, 104p
Prepared in cooperation with Cambridge Scientific Abstracts, Washington, DC.

This bibliography cites literature on the safety aspects for the design and operations of ports and harbors, including deepwater terminals. Design includes port access and approach; currents, tides and configuration, including breakwaters; and risk analysis. Operational aids to safety include traffic control and communications, firefighting, security, and ancillary equipment, such as tugs and cargo handling equipment. Some of the literature pertains to minimizing hazardous risks inherent in some cargoes, such as chemicals and LNG. There are a few abstracts which reference literature on vessel traffic data, special ports for typhoon havens, and harbor accident reports. Some of the abstracts reference national and international conferences. (Contains 119 citations fully indexed and including a title list.)

PB82-859109 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Wooden construction. 1970-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 229p

This bibliography cites reports concerned with design and analysis of wooden buildings and structural members. Wood truss roof and floor systems, truss load distribution, connectors, and joints are discussed. Timber structural design and joining systems and analysis are considered. Seismic design, wind loading, sound insulation, floor joist loading studies, wood foundations, stud wall analysis, and heat transfer for wood frame construction are discussed. (Contains 268 citations fully indexed and including a title list.)

14.

METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

AD-A107 015/0 Not available NTIS
Harris Corp., Melbourne, FL. Government Systems Group.
Interferometric Spectrum Analyzer,
A. Vander Lugt. 9 Feb 81, 11p ARO-17614.1-P
Contract DAAG29-80-C-0149
Availability: Pub. in Applied Optics, v20 n16 p2770-2779, 15 Aug 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 099/4 PC **A05**/MF **A01**
RCA Government Systems Div., Burlington, MA.
Modification of Laser Rangefinder MX-9838( )/GVS-5 Into a Visioceilometer Optical Unit.
Final rept. Oct 79-Oct 80,
J. M. Quinn, and J. H. Woodward. Oct 79, 84p
Contract DAAK20-79-C-0038

This report covers the research and development effort to modify an AN/GVS-5 Laser Rangerfinder to perform the optical and display function of a hand held Visioceilometer. (Author)

AD-A107 198/4 PC **A09**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Automatic Microwave Network Analyzer Calibration by Reference to a Transmission-Line Standard with Applications to Characterization of Adapters, Devices, and Coaxial Lines with SMA Connectors.
Doctoral thesis,
Joseph Peter DiBeneditto. Oct 81, 188p Rept no. AFIT-CI-81-12D

This dissertation describes the development of new techniques for calibrating a microwave automatic network analyzer (hereafter ANA) for complex reflection measurements. These techniques promise significant advantages for miniature connector systems. They include the use of an experimentally-derived characterization of an APC-7 open-circuit termination as a high-reflection calibration standard, adapter correction based on low dissipative losses, and a length of transmission line instead of a sliding load or fixed termination as a low-reflection standard. Gains afforded by these new techniques are reduced operator intervention during calibration, less wear of the measurement port connectors, lower equipment and maintenance costs, and calibrations referenced to standards truly

relevant to the interconnecting transmission medium. Computer memory requirements are increased, but the cost of the increase is insignificant compared to the cost of microwave instrumentation. Slightly longer calibration times are offset by reduced demands upon operator skill. Methods of extending these calibration techniques to full two-port measurements will be discussed. (Author)

AD-A107 213/1 Not available NTIS
University of Southern California, Los Angeles. Dept. of Aerospace Engineering.
Hot-Wire and Hot-Film Anemometers,
Ron F. Blackwelder. 1981, 58p ARO-16651.2-E
Contract DAAG29-79-C-0137, Grant DA-ARO-D-31-124-73-G118
Availability: Pub. in Methods of Experimental Physics: Fluid Dynamics, v18 PtA 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 228/9 PC **A02**/MF **A01**
California Univ., Los Angeles. Dept. of Materials Science and Engineering.
Magnetomechanical Acoustic Emission--A New Method for Non-Destructive Stress Measurement.
Journal article,
M. Shibata, and K. Ono. 1981, 9p Rept no. TR-81-02
Contract N00014-81-K-0011
Pub. in NDT International, p227-234 Oct 81.

No abstract available.

AD-A107 388/1 PC **A02**/MF **A01**
Wayne State Univ., Detroit, MI. Dept. of Physics.
Laser Photoacoustic Technique for NDE.
Final rept. 16 Aug 78-15 Aug 81,
R. L. Thomas. 26 Oct 81, 6p ARO-15746.14-MS
Contract DAAG29-79-C-0151, Grant DAAG29-78-G-0182

The physics of the scanning photoacoustic microscopy (SPAM) has been developed. SPAM has been applied to NDE problems in high performance ceramics, and has been shown to be potentially useful for NDE in other solids, such as metals and semiconductors. One of the most important problems in nondestructive evaluation (NDE) has been that of detecting small (10 micron - 100 micron) flaws which lie just beneath the surface of an opaque solid. This problem is particularly acute for the technologically important, but brittle, ceramic materials, SiC and Si3N4. The objective of this program was to investigate and develop an entirely new NDE experimental technique, which we have named scanning photoacoustic microscopy (SPAM), and to test its applicability for subsurface NDE of ceramics.

JPRS-79119 PC **A04**/MF **A01**
Joint Publications Research Service, Arlington, VA.
Soviet Science and Technology Policy.
2 Oct 81, 63p
Trans. of Russian articles.

This non-serial report contains selected translations of Russian articles on the planning and administration of Soviet research and development and the introduction of scientific achievements into industry.

LA-UR-80-585 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Statistical Validity for Electron Probe Microanalysis of Organic Sulfur in Coal.
R. Raymond, Jr., T. D. Davies, and R. C. Hagan. 1980, 7p CONF-800815-2
Contract W-7405-ENG-36
Microprobe Analytical Society conference, San Francisco, CA, USA, Aug 1980.

It is shown that EPM of a relatively few vitrinite grains gives a good representation of the organic sulfur content of the entire vitrinite population. The use of photomosaics is not needed in order to provide statistically valid data. (ERA citation 05:026804)

LBL-10386 PC **A02**/MF **A01**
California Univ., Berkeley.
Seismic Isolation of an Electron Microscope.
W. G. Godden, M. Aslam, and D. T. Scalise. Jan 80, 11p CONF-800919-3
Contract W-7405-ENG-48
World conference on earthquake engineering, Istanbul, Turkey, 8 Sep 1980.

A unique two-stage dynamic-isolation problem is presented by the conflicting design requirements for the foundations of an electron microscope in a seismic region. Under normal operational conditions the microscope must be isolated from ambient ground noise; this creates a system extremely vulnerable to seismic ground motions. Under earthquake loading the internal equipment forces must be limited to prevent damage or collapse. An analysis of the proposed design solution is presented. This study was motivated by the 1.5 MeV High Voltage Electron Microscope (HVEM) to be installed at the Lawrence Berkeley Laboratory (LBL) located near the Hayward Fault in California. (ERA citation 05:032747)

N82-11090/9 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
An Algorithm for Minimum-Cost Set-Point Ordering in a Cryogenic Wind Tunnel.
J. S. Tripp. Nov 81, 32p NASA-TP-1923, L-14695

An algorithm for minimum cost ordering of set points in a cryogenic wind tunnel is developed. The procedure generates a matrix of dynamic state transition costs, which is evaluated by means of a single-volume lumped model of the cryogenic wind tunnel and the use of some idealized minimum-costs, which is evaluated by means of a single-volume lumped model of the cryogenic wind tunnel and the use of some idealized minimum-cost state-transition control strategies. A branch and bound algorithm is employed to determine the least costly sequence of state transitions from the transition-cost matrix. Some numerical results based on data for the National Transonic Facility are presented which show a strong preference for state transitions that consume to coolant. Results also show that the choice of the terminal set point in an open odering can produce a wide variation in total cost.

N82-11105/5 PC **A02**/MF **A01**
California Univ., Los Angeles. Inst. of Geophysics and Planetary Physics.
Magnetic Field Investigation for ISEE Mother and Daughter Spacecraft.
Final Report.
C. T. Russell. 7 Jun 81, 4p NASA-CR-166713
Contract NAS5-20064

Highlights of the design and fabrication of fluxgate magnetometers for the ISEE A and B satellites which were launched from a single launch vehicle into the same highly elliptical orbit are presented. The instrument consisted of four basic assemblies: the sensors, the drive and sense electronics, the data handling unit; and the flipper. The digital handling data handling assembly contained a digital filter that mantained a uniform transfer function for all three axes of both spacecraft. Initial studies centered on the bow shock and the magnetopause and show that both boundaries are in rapid motion. The bow shock was found to be very thin, close to an ion inertial length in thickness, but the magnetopause was much thicker than expected, about 400 to 1000 km on average. The magnetometers have each logged over 3 2/3 years of continuous operation.

N82-11433/1 PC **A02**/MF **A01**
South African Bureau of Standards, Pretoria.
Standard Specification for Apparatus for gamma Radiography.
5 Nov 80, 21p SABS-1317-1980, ISBN-0-626-05688-8

The constructional requirements of portable, mobile, and fixed apparatus for gama radiography designed to allow the controlled use of radiation for industrial purposes are specified. Apparatus operated by removing the sealed scurce from the exposure container on a handlin device is not covered by this specification. The performance requirements which such apparatus should meet in order to safeguard people from radiation hazards during its normal operation are presented.

N82-11435/6 PC **A10**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Low-Cost Solar Array Project: Four Absolute Cavity Radiometer (Pyrheliometer) Intercomparisons at New River, Arizona: Radiometer Standards.
R. S. Estey, and C. H. Seaman. Jul 81, 207p NASA-CR-164950, JPL-PUB-81-60
Contracts NAS7-100, EX-76-A-29-1012

Four detailed intercomparisons were made for a number of models of cavity-type self-calibrating radiometers (pyrheliometers). Each intercomparison consisted of simultaneous readings of pyrheliometers at 30-second intervals in runs of 10 minutes, with at least 15 runs per intercomparison. Twenty-seven instruments were in at least one intercomparison, and five were in all four. Summarized results and all raw data are provided from the intercomparisons.

N82-11511/4 PC **A05**/MF **A01**
Ball Aerospace Systems Div., Boulder, CO.
Development of the Coastal Zone Color Scanner for Nimbus 7. Volume 1: Mission Objectives and Instrument Description.
Final Report.
May 79, 76p NASA-CR-166720-V-1, F78-11-REV-A
Contract NAS5-20900

An Earth scanning six channel (detector) radiometer using a classical Cassegrain telescope and a Wadsworth type grating spectrometer was launched aboard Nimbus 7 in order to determine the abundance or density of chlorophyll at or near the sea surface in coastal waters. The instrument also measures the sediment or gelbstroffe (yellow stuff) in coastal waters, detects surface vegetation, and measures sea surface temperature. Block diagrams and schematics are presented, design features are discussed and each subsystem of the instrument is described. A mission overview is included.

N82-11515/5 PC **A03**/MF **A01**
OAO Corp., Hampton, VA.
Technology Transfer of NASA Microwave Remote Sensing System.
Final Report.
N. D. Akey. Oct 81, 38p NASA-CR-165791
Contract NAS1-16380

Viable techniques for effecting the transfer from NASA to a user agency of state-of-the-art airborne microwave remote sensing technology for oceanographic applications were studied. A detailed analysis of potential users, their needs and priorities; platform options; airborne microwave instrument candidates; ancillary instrumentation; and other, less obvious factors that must be considered were studied. Conclusions and recommendations for the development of an orderly and effective technology transfer of an airborne microwave system that could meet the specific needs of the selected user agencies are reported.

N82-11698/9 PC **A02**/MF **A01**
Oregon Univ., Eugene.
Far-Infrared Measurements of Trace Gases.
Final Technical Report.
I. G. Nolt, and J. V. Radostitz. Sep 80, 6p NASA-CR-164965
Grant NSG-7360

A better detector system was developed for far infrared spectroscopy by usng cryogenic technology to cool bolometric detectors to approximately 0.4K. Technical assistance was provided to two submillimeter infrared balloon experiment (SIBEX) flights which demonstrated the diagnostic capability of far IR emission spectroscopy. It is estimated that more than a hundred spectral emission features were detected which are not due to the main emitting gases O3, O2, and H2O. The trace species sources for many features still remain unidentified and the spectra obtained during the SIBEX flights present a new source of information on stratospheric composition.

N82-11862/1 PC **A07**/MF **A01**
Intergraph Corp., Huntsville, AL.
Digital Ultrasonics Signal Processing: Flaw Data Post Processing Use and Description.
Final Report.
V. E. Buel. 30 Sep 81, 141p NASA-CR-161882
Contract NAS8-33100

A modular system composed of two sets of tasks which interprets the flaw data and allows compensation of the data due to transducer characteristics is described. The hardware configuration consists of two main units. A DEC LSI-11 processor running under the RT-11 single job, version 2C-02 operating system, controls the scanner hardware and the ultrasonic unit. A DEC PDP-11/45 processor also running under the RT-11, version 2C-02, operating system, stores, processes and displays the flaw data. The software developed the Ultrasonics Evaluation System, is divided into two catagories; transducer characterization and flaw classification. Each category is divided further into two

functional tasks: a data acquisition and a postprocessor ask. The flaw characterization collects data, compresses its, and writes it to a disk file. The data is then processed by the flaw classification postprocessing task. The use and operation of a flaw data postprocessor is described.

PB82-109851 PC **A17**/MF **A01**
National Bureau of Standards, Washington, DC.
User's Manual for Factor-Jump Thermogravimetry Apparatus, and Associated Programs, Including a General Plotting Program,
Brian Dickens. Mar 81, 387p NBSIR-80-2102
Portions of this document are not fully legible.

The publication describes the operation of the computerized thermogravimetry apparatus. Detailed instructions are given to enable the user to bootstrap the computer and run the various programs. The items covered are (1) the thermogravimetry program TGRUNF, (2) the data file editing program TGEDIT, (3) estimation of trimmed means by TGTRIM, (4) general calculation of activation energy from rate data; probability plots by TGDEPG, (5) the generalized polynomial fitting program POLGEP, (6) publication tables by TABLEP, (7) the BASIC program BMPD which operates the computer interface in a general fashion and (8) user-directed and automated plotting using the generalized plotting program PABS. Appendices on cautionary remarks and cable diagrams are included.

PB82-118209 PC **A02**/MF **A01**
Environmental Research Lab., Athens, GA.
Inductively Coupled Plasma-Atomic Emission Spectrometric Analysis of Environmental Samples Using Ultrasonic Nebulization.
Journal article,
Charles E. Taylor, and Terrance L. Floyd. 5 Jan 81, 8p EPA-600/J-80-044
Pub. in Applied Spectroscopy, v35 n4 p408-413 1981.

Ultrasonic and pneumatic nebulizers used in inductively coupled plasma-atomic emission spectrometry (ICP-AES) are compared in the analysis of standard materials and environmental samples. Results verify that ICP-AES with ultrasonic nebulization is capable of lower detection limits than ICP-AES with a pneumatic system. The ultrasonic system used with desolvation, therefore, is the more desirable system when ultra-trace ICP-AES quantitative analyses are required in a variety of environmental samples.

PB82-130063 PC **A03**/MF **A01**
Wyle Labs., Huntsville, AL.
Terrestrial Solar Simulators for Photovoltaic and Combined Photovoltaic and Thermal Device Measurement and Evaluation.
Final rept.,
S. Patrick, and R. Giuntini. Oct 80, 50p WR-80-34, NBS/GCR-80-279
Contract NB79-SBCA-0079
Sponsored in part by Solar Energy Research Inst., Golden, CO.

The use of terrestrial solar simulators used for testing photovoltaic and combined photovoltaic/thermal devices by a representative cross section of the photovoltaics community is reviewed. Measurements-related needs identified by this comaunity are also reviewed. Among the needs identified are major improvements in the area of standardized test and calibration procedures. Also identified is the need for a source dedicated to providing reference cells to the photovoltaics community and for workshops to address measurements-related problems and developments. Included are tables that review the type and use of terrestrial solar simulators used and that list data-sheet information about these simulators.

PB82-135716 PC **A02**/MF **A01**
Bureau of Mines, Albany, OR. Albany Research Center.
Modification of a Commercial Atomic Absorption Spectrophotometer for Cold-Vapor Determination of Mercury.
Rept. of investigations,
Jospeh A. Perry, Raymond F. Farrell, and Alick J. Mackie. Oct 81, 17p BUMINES-RI-8573
Library of Congress catalog card no. 81-607897.

One goal of the Bureau of Mines is to develop technology to insure a dependable supply of minerals to the United States. To support this goal, the Bureau's Albany Research Center has modified a commercial atomic absorption spectrophotometer to rapidly determine trace levels of mercury by cold-vapor atomic absorption spectrophotometry. Such diverse materials as ores, mill products, stream water, sediments, and flue dust have been analyzed. A very high dynamic range of 0.2 ng/ml to 1 microgram/ml of mercury in solutions is routinely analyzed by this instrument.

PB82-137316 PC **A07**/MF **A01**
General Electric Co., Wilmington, MA.
Development of Fuel Cell Gas Detection Instruments for Use in a Mine Atmosphere.
Open file rept. (Final) Sep 77-Mar 79,
J. A. Kosek, A. B. LaConti, A. Goldstein, G. Schnakenberg, and E. Chilton. Mar 79, 132p BUMINES-OFR-164-81
Contract H0357078

The objective of this report was to develop instruments for detecting CO, NO, and NO2 in a mine atmosphere using fuel cell technology. The approach was to optimize the fuel cell sensor configuration for the specific detection of CO, NO, and NO2 in the presence of other mine gases utilizing recent advances in catalyst, electrode, and solid polymer electrolyte membrane technology. Parametric testing was conducted on three electrode sensor cells to define performance and life characteristics as a function of temperature, feed flow, and applied sensor voltage. Extended life testing was performed on sensor cell configurations exhibiting favorable characteristics. Reliable, efficient gas sampling and electronic control circuitry was fabricated for use with the sensor cells and integrated into devices to meet the performance and design specifications for portable, battery-operated, hand-held direct-indicating gas detectors for use underground.

PB82-137662 PC **A03**/MF **A01**
Environmental Monitoring and Support Lab.-Cincinnati, OH.
Performance Tests for the Evaluation of Computerized Gas Chromatography/Mass Spectrometry Equipment and Laboratories,
William L. Budde, and James W. Eichelberger. Apr 80, 43p EPA-600/4-80-025

A series of ten general purpose tests are described which are used to evaluate the performance of computerized gas chromatography-mass spectrometry systems. All of the tests use the continuous, repetitive measurement of spectra method of data acquisition, and no selected ion monitoring tests are included. Evaluation criteria are given with each performance test. Some of the tests go beyond equipment performance, and may be used to evaluate the performance of laboratories using GC/MS for organics analysis.

PB82-139064 PC **A03**/MF **A01**
Southampton Univ. (England). Inst. of Sound and Vibration Research.
Acoustic Model Power Distribution in a Duct at High Frequencies.
Technical rept.,
S. M. Baxter. Apr 81, 42p ISVR-TR-111

The work described in this report represents part of a project undertaken with the National Gas Turbine Establishment (N.G.T.E.). The project is an experimental and theoretical investigation of the distribution of acoustic power among the modes of an acoustic duct. The duct forms part of an absorber test facility. The experiment is intended to test an assumption currently used in interpreting data from the facility, namely that the sound power in the duct is equally distributed among the propagating acoustic modes. The report is essentially a progress report, and covers the theoretical basis for the measurement technique. At the time of writing the experiment and its analysis are not complete. Section 2 of the report provides a brief description of the experiment and its motivation. Sections 3-5 present the theory, and Section 6 is a summary.

PB82-139320 PC **A05**/MF **A01**
GCA Corp., Bedford, MA. GCA Technology Div.
High Concentration Dust Monitor.
Open file rept. (Final) 28 Dec 79-29 May 81,
Pedro Lilienfeld. Jun 81, 77p BUMINES-OFR-159-81
Contract H0308010

The objective of this investigation was the development, design, fabrication, and testing of a portable, self-contained prototype monitoring instrument capable of detecting and measuring airborne coal dust levels as concentrations in the range of 20 to 500 g/cu m. The output of the high concentration dust monitor is essentially independent of particle size and composition, with a response time of 10 seconds. Direct concentration readout as well as internal memory or recording capabilities are incorporated in the device. The operation of the instrument is based on direct sensing of the mass concentration of airborne dust by air-path beta radiation attenuation. The monitor is battery operated and incorporates a microprocessor that controls periodic automatic zero referencing, executes the mass computations, records the data for subsequent playback, and performs internal diagnostic checks. The design emphasizes ruggedness, simplicity of operation, and adherence to intrinsic safety requirements.

PB82-140609
(Order as PB82-140575, PC **A05**/MF **A01**)
National Bureau of Standards, Boulder, CO. National Engineering Lab.
A Transient Hot Wire Thermal Conductivity Apparatus for Fluids,
Hans M. Roder. 26 May 81, 37p
Contract NASA-C-32369-C
Sponsored in part by National Aeronautics and Space Administration, Washington, DC.
Included in Jnl. of Research of the National Bureau of Standards, v86 n5 p457-493, Sep-Oct 81.

A new apparatus for measuring the thermal conductivity of fluids is described. This is an absolute method utilizing a transient hot wire. Measurements are made with a 12.7 micrometers diameter platinum wire at real times of up to 1 second. The data acquisition system includes a minicomputer and a digital voltmeter. The experimental core of the system incorporates a compensating hot wire in a Wheatstone bridge circuit. The cell containing the core of the apparatus is designed to accommodate pressures from 0 to 70 MPa and temperatures from 70 to 320 K. Oxygen was measured over a wide range of physical states including the dilute gas, the moderately dense gas, the near critical region, the compressed liquid states, and the vapor at temperatures below the critical temperature. Performance checks of the apparatus were conducted with nitrogen, helium and argon. Measurement of rare gases allows a direct comparison to the kinetic theory of gases through the viscosity. A second check looks at the variation of the measured thermal conductivity as a function of the applied power. The precision (2 sigma) of the new system is between 0.5 and 0.8 percent for wire temperature transients of 4 to 5 K, while the accuracy is estimated at around 1.5 percent.

PB82-802471 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Hot Film Anemometry. 1964-November, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Nov 81.
Dec 81, 68p
Supersedes PB80-814288, and NTIS/PS-79/0909.

The principles of hot film anemometer operation are summarized; wind tunnel and laboratory tests are described; flow field dynamics are discussed involving turbulence, boundary layers, separation, shock waves, and stresses; mathematical models and analysis are presented; computer techniques are outlined; and a number of applications are given. (This updated bibliography contains 60 citations, 2 of which are new entries to the previous edition.)

14E. Reprography

AD-A106 823/8 Not available NTIS
Michigan Univ., Ann Arbor.
Tomographic Reconstruction of Strongly Refracting Fields and Its Application to Interferometric Measurement of Boundary Layers,
Soyoung Cha, and C. M. Vest. 24 Dec 80, 9p ARO-17698.1-E
Contract DAAG29-81-K-0015
Availability: Pub. in Applied Optics, v20 n16 p2787-2794, 15 Aug 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 020/0 Not available NTIS
Wisconsin Univ.-Milwaukee.
Holographic Displacement Analysis with Multimode-Fiber Optics,
J. A. Gilbert, and J. W. Herrick. 17 Jun 80, 7p ARO-17357.3-E
Contract DAAG29-80-K-0028
Availability: Pub. in Experimental Mechanics, v21 n8 p315-320 Aug 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 212/3 PC **A02**/MF **A01**
Rome Air Development Center, Hanscom AFB, MA. Deputy for Electronic Technology.
Optical Processing of Photographic Images,
F. T. S. Yu, and J. L. Horner. 4 May 81, 13p Rept no. RADC/ETR-81-0016
Pub. in Optical Engineering, v20 n5 p666-676 Sep/Oct 81. Original contains color plates: All DTIC and NTIS reproduction will be in black and white.

No abstract available.

AD-A107 485/5 PC **A03**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Determination of the Relationship between Information Capacity and Identification by Simulated Aerial Photography.
Master's thesis,
Michael R. Jones. 27 Jun 78, 47p Rept no. AFIT-CI-79-252T

The relationship between information capacity and the ability of photointerpreters to identify vehicles in simulated aerial reconnaissance was investigated. An aerial scene lighting simulator was constructed and used in the production of a series of simulated aerial reconnaissance photographs of models of military tanks and trucks. The information capacity of these photos was varied by defocussing the taking camera and the simulated ground scale was varied by changing the taking camera reduction. Duplicate positives of these images were evaluated by trained military photointerpreters who determined the resolving power and attempted to identify the vehicles from a key provided. The resulting empirical probability of correct identification for each vehicle was plotted against the information capacity, which was computed as one half the square of the resolving power. For a probability of correct identification of 0.80, these curves indicate that an information capacity of 7.4 bits per square meter on the ground is required to identify tanks, and 2 bits per square meter is required for identification of trucks.

PB82-858051 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Dust-Free Printing. 1975-1981 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for Jan 75-Dec 81.
Dec 81, 202p

Reports are cited which discuss methodology for providing dust-free printing operations, of which printing equipment, materials, and processes are emphasized. Photopolymer printing plates, press variations affecting linting performance of web offset newsprint, letterpress, wrap-around and offset lithography, electrostatic charge removal, paper coating lubricants, and pulp treatments are discussed relative to lint-free printing. Printing ink manufacturing to produce dust-free inks are included. (Contains 135 citations fully indexed and including a title list.)

15. MILITARY SCIENCES

15C. Defense

AD-A107 108/3 PC **A03**/MF **A01**
Army Engineer Studies Center, Washington, DC.
Survivability--The Effort and the Payoff.
Final rept.,
Eugene Ehrlich, and G. Leslie Geiger. Jun 81, 47p Rept no. R-81-8

This monograph assesses the value of protective construction and attempts to clarify the question of its cost-effectiveness as it affects the engineer battalion. By reviewing the work of others, it shows that protective construction is effective, both historically and analytically. It also provides an estimate of effort required for minimum level of protective construction, draws conclusions relative to its cost benefit, shows that it has a high payoff, and hopefully provides for better decisions as to how much engineer effort can and should be diverted to survivability. (Author)

DE82000441 PC **A07**/MF **A01**
Oak Ridge National Lab., TN.
Proposed New Handbook for the Federal Emergency Management Agency: Radiation Safety in Shelters.
C. M. Haaland. Sep 81, 143p ORNL-5766
Contract W-7405-ENG-26

This handbook is proposed to replace the portion of the current Handbook for Radiological Monitoring that deals with protection of people in shelters from radiation from fallout resulting from nuclear war. Basic information at a high-school level is given on how to detect nuclear radiation, how to find and improve the safest places in a shelter, the necessity for and how to keep records on individual radiation exposures, and how to minimize exposures. Several new procedures are introduced, some of which are based more on theoretical considerations than on actual experiments. These procedures include: the method of time-averaging radiation readings taken with one instrument in different locations of a large shelter while fallout is coming down and radiation levels are climbing too rapidly for direct comparison of readings to determine the safest location; the method of using one's body to obtain directionality in radiation readings taken with a standard Civil Defense Survey meter; the method of using mutual shielding to reduce the average radiation exposure to shelter occupants; and the ratio method for estimating radiation levels in hazardous areas. (ERA citation 06:035777)

15E. Logistics

AD-A106 994/7 PC **A02**/MF **A01**
Navy Personnel Research and Development Center, San Diego, CA.
Supply Workload Implications of Increased Deployment to the Indian Ocean.
Final rept.,
Robert P. Woon. Oct 81, 20p
See also Rept. nos. NPRDC-TR-76QT-39, AD-A035 589, NPRDC-TR-77-21, AD-A037 799 and NPRDC-TR-77-23, AD-A038 419.

A Pacific Fleet Logistics Model has been developed to forecast the changes in workload on the Navy's Pacific supply centers and depots caused by changes in fleet size, fleet configuration, and deployment pattern. This report describes the verification and validation of the model by using actual homeporting and employment schedules. Projected supply workload results are presented to determine the effects of increased deployment to the Indian Ocean. (Author)

AD-A107 141/4 PC **A03**/MF **A01**
Logistics Management Inst., Washington, DC.
Depot Support of Gas Turbine Engines.
Final rept.,
T. J. O'Malley, and David V. Glass. Oct 81, 39p Rept no. LMI-ML103
Contract MDA903-81-C-0166

This report assesses the DoD's capacity and capability to support the depot maintenance requirements of gas turbine engines over the next 5-10 years. Special attention is given to newer nonaeronautical applications (tanks, marine propulsion, and cruise missile). Gas turbine engines used in fixed and rotary wing aircraft will continue to dominate the engine workload; the gas turbines used in cruise missiles, tanks, and ships will comprise less than 10 percent of the total engine workload by 1990. Additional depot maintenance capacity to support gas turbine engines is not required. The depots have adequate capacity today, and since the gas turbine workload is projected to increase by only 6 percent between FY 82 and FY 87, capacity should remain adequate through the 1980s. The Military Departments have the required capabilities to support the new nonaeronautical gas turbine engines entering the DoD inventory. They have repaired similar engines, both in size and technology, for several years. (Author)

AD-A107 142/2 PC **A02**/MF **A01**
Logistics Management Inst., Washington, DC.
Joining the Defense Directives and Defense Acquisition Regulatory Systems,
Alvin W. Platt, and David M. Conrad. May 79, 14p Rept no. LMI-RE902
Contract MDA903-77-C-0370

The Defense Acquisition Regulatory System (DAR System) provides detailed regulations governing Department of Defense (DoD) acquisition of supplies and services. The DoD Directives System provides overall DoD-level instructions, direction and policy on any subject. All acquisition policies and directions contained in directives and instructions issued under the DoD Directives System should be implemented in the DAR. The purpose of this study was to determine how effectively the DAR and the DoD Directive System are or can be joined. The findings indicate that there are no serious impediments to joining the two systems. Directives and instructions sometimes contain language affecting acquisition which often is not incorporated into the DAR. Differing interpretations of the scope of the acquisition process create some difficulty in identifying specific acquisition related issuances. The DoD Directives System does not assign the subject 'acquisition' to any specified numerical sequence. It is recommended that the definition of acquisition in the pending draft revision to the DAR be used universally. The DAR should incorporate all acquisition material now appearing in directives and instructions into a new 'policy' section and become the complete set of regulations governing acquisition policy and procedures. In addition, coordination procedures for review of new directives and instructions should be tightened within OUSDRE so that a positive indication of any impact on the DAR is documented during the coordination cycle of such directives and instructions.

AD-A107 174/5 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Procurement, Logistics, and Readiness Div.
The Navy Must Improve Its Accountability for Conventional Ammunition.
29 Jul 81, 13p Rept no. GAO/PLRD-81-54

This study has found that the Navy's Conventional Ammunition Inventory Management System (CAIMS) does not provide the required accountability to effectively manage sizable ammunition inventories. The Navy has been unable to reconcile its inventory records with those of the single manager for conventional ammunition. Moreover, the inventory controls necessary to maintain accountability and visibility over fleet ammunition returned to weapons stations are either weak or nonexistent. Therefore, managers rely upon data that inaccurately reflect the quantity, location, and condition of this ammunition. Sound management practices are needed to correct these weaknesses. Six recommendations are provided.

AD-A107 235/4 PC **A04**/MF **A01**
Hayya (Jack C.) Associates, State College, PA.
Forecast of the Second Destination Transportation Tonnage for the Air Force.
Final rept.,
Jack C. Hayya. Feb 79, 51p
Contract F33615-78-C-5214

This study analyzed the time series of second destination tonnage and suggests models to forecast them. An assortment of models were attempted including: exponential smoothing, polynominal regression, and

Box-Jenkins, and the author found that a range of models can be used to forecast tonnage. The models were applied to eleven tonnage series, and two different types of forecasting models were recommended based on the principal of cost-effectiveness; single exponential smoothing for nine of the series, and decomposition of the remaining two. There is no implementation cost in terms of computer programming or training in following these recommendations. Only two values are stored for exponential smoothing--the current tonnage and the forecast for current period. Time series decomposition requires the use of seasonal indices only. Seasonal indices are provided by the author. (Author)

AD-A107 279/2 PC **A06**/MF **A01**
Logistics Management Inst., Washington, DC.
An Evaluation of Spares Acquistion Integrated with Production,
Brenda J. Allen, and John B. Abell. Aug 81, 111p
Rept no. LMI-ML108
Contract MDA903-81-C-0166

Spares Acquisition Integrated with Production (SAIP) is the concurrent procurement of items to serve as spares and items to be installed as components of weapon systems. It is cost-effective during initial provisioning and may remain so throughout weapon-system production. The two most important characteristics of SAIP that support this conclusion are: (1) SAIP results in lower unit prices, not only for spares but also for components to be installed during production (production installation items); and (2) SAIP enhances the timely availability of spared, and thus weapon-system readiness. We recommend that the Office of the Secretary of Defense: (1) Require evaluation of SAIP for the initial provisioning for all major weapon-system acquisition programs. (2) Revise DoD Directive 4140.40 to allow the concurrent procurement of spares and production installation items; (3) Require evaluation of SAIP for replenishment provisioning, in conjunction with the economic with the economic analysis undertaken to decide whether procurements should be broken out from the prime contractor; and (4) Revise DoD Directive 7200.4 to allow the advance procurement of long-leadtime spares prior to the fiscal year in which the related end item is to be procurred.

AD-A107 374/1 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Information on the U.S. Coast Guard's Decision to Purchase the M/V Cowslip Vessel.
25 Jun 81, 7p Rept no. GAO/CED-81-128

We have reviewed the Coast Guard's decision to purchase the Cowslip and found no basis to conclude that the purchase decision was improper. However, the Coast Guard relied on its own assessments of the relative conditions of both vessels. These assessments were not verified by a separate Coast Guard in-house assessment or by commercial vessel surveyors. Furthermore, cost comparisons developed by the Coast Guard and used in the purchase decision were based on cost estimates provided by the Coast Guard's Office of Engineering and were not independently verified. The final decision to purchase the Cowslip was approved by the Assistant Secretary for Administration, Department of Transportation. In conducting our work we reviewed Coast Guard vessel inspection reports and purchase, renovation, and repair cost data used in evaluating the relative merits of the two vessels and arriving at the purchase decision. We met with and held discussions with Coast Guard officials who (1) performed the vessel inspections, (2) developed the cost data used in making the purchase decision, and (3) made the decision to purchase the Cowslip. We also held discussions with Department of Transportation officials involved in the purchase decision. Our work was conducted at Coast Guard and Department of Transportation Headquarters in Washington, D.C.

AD-A107 451/7 PC **A04**/MF **A01**
Army Logistics Evaluation Agency, New Cumberland, PA.
Aviation Materiel Combat Ready In-Country (AMCRIC).
Agency rept.,
Herman M. Orrell, III. Jun 81, 58p

A previous study--titled Aviation Materiel Combat Ready In-Country (AMCRIC)--was provided as a basis to develop a concept to preposition Army aircraft in US Army Europe. This study recognized that aircraft are not authorized as war reserve, and that no aircraft are currently included in POMCUS in Europe. To adequately reinforce NATO, some method had to be devised to allow Army aircraft to be immediately available to a deploying combat force. The project considered: (a) Methods available to accomplish prepositioning of Army helicopters and ancillary systems; (b) South Vietnam Army aviation experience in combat; (c) State-of-the-art storage methods by US Government, foreign governments, and commercial contractors; and (d) Major command interfaces within the US Army that will be required to establish a workable concept. The project results were that US Army has the capability to store helicopters for short periods using on-hand resources; and The Vice Chief of Staff, Army, approved a prepositioning concept developed which will store helicopters in USAREUR on a test bed basis using AH-1S helicopters.

AD-A107 499/6 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Mission Analysis and Acquisition Div.
Military Contractor-Operated Stores' Contracts are Unmanageable and Vulnerable to Abuse.
Report to the Congress.
8 Jul 81, 71p Rept no. GAO/MASAD-81-27

Contractor-operated base stores were once envisioned as a practical and cost-effective means for buying vehicle repair parts and civil engineering supplies, but are now plagued by pricing irregularities, contract abuses, and repeated allegations of fraud. The Department of the Air Force, despite concentrated efforts over the last several years, has been unable to develop a workable store contract for purchasing the thousands of low-cost, commercial items its bases need daily. GAO thinks the Secretary of Defense should discontinue the use of contractor-operated stores. Workable, cost-effective alternatives, such as the Government-operated stores, should be used to establish purchasing control. (Author)

AD-A107 518/3 PC **A02**/MF **A01**
School of Aerospace Medicine, Brooks AFB, TX.
Optimal Staging and Scheduling in Airlift Operations.
Interim rept. Jan-Jul 80,
Sherwood W. Samn. Sep 81, 16p Rept no. SAM-TR-81-21

This report shows that to achieve maximum aircraft utilization in airlift operations, optimal scheduling and staging can be formulated as a generalized network problem and solved using mixed-integer programming techniques. (Author)

PB82-136409 PC **A04**/MF **A01**
Boston Univ., MA.
Implications of Power Plant Coal Conversions on the Ports of New England: Volume I.
Final rept.,
Jeffrey P. Osleeb, and Samuel J. Ratick. Oct 81, 65p MA-RD-940-82004
See also PB82-136417.

This document presents the results of a systematic study of the transportation of coal into the New England region. This coal movement is to satisfy the anticipated energy demands of the electric utilities in the regions which have been ordered to convert to coal under the 1978 Fuel Use Act. Historically, waterborne movements of coal into the New England region were very important. The results of this analysis indicate that waterborne movements of coal can once again predominate. Even with the added investments necessary for the construction of new coal handling equipment at the ports of New England and the costs associated with additional coal transfers, water modes tend to be the most economical.

PB82-136417 PC **A10**/MF **A01**
Boston Univ., MA.
Implications of Power Plant Coal Conversions on the Ports of New England. Volume II: Appendices,
Jeffrey P. Osleeb, and Samuel J. Ratick. Oct 81, 206p MA-RD-940-82004
See also PB82-136409.

Mandated electric generation coal conversions in New England could place a severe strain on the coal handling and transportation facilities in New England ports. This paper presents an analytical scheme leading to the development of optimal plans for the reuse and redevelopment of marine transport networks in New England. Utilizing a port inventory that provides information on existing coal handling facilities and the capability of the ports to increase capacity, a mathematical programming model is used to determine the optimal capacity, placement, and railroad and marine interface of coal handling facilities within and between the New England ports and converting power plants.

15G. Operations, Strategy, and Tactics

AD-A106 898/0 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Mission Analysis and Acquisition Div.
Questionable Use of the C-X and Other Air Force Weapon System Funds.
10 Sep 81, 6p Rept no. GAO/MASAD-81-41

The C-X is one of several weapon systems being managed by the Deputy of Airlift and Trainer Systems (Deputy for Airlift), Aeronautical Systems Division (ASD), Air Force Systems Command (AFSC), Wright-Patterson Air Force Base, Ohio. Some matters concerning the Air Force's use of weapon system funds came to our attention during our review of the C-X which we believe warrant your attention. Specifically, about $531,000, or 36 percent, of the C-X funds released by AFSC to ASD's C-X System Program Office (SPO) as of July 1, 1981, had been allocated for a building renovation, purchase of general-purpose automatic data processing equipment, and a management information system study. In our opinion, we question whether these funds have been used in a manner contrary to the intent of the congressional approval of the C-X program. Also, the continuing use of C-X funds in this manner may be inappropriate because the costs of such general-purpose projects, which are necessary for ASD to carry out its basic mission of developing and acquiring weapon systems, are normally charged to acquisition and command support funds rather than mission program funds. (Author)

AD-A107 047/3 PC **A04**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
Mine/Countermine Problems During Winter Warfare.
Final rept.,
Virgil Lunardini. Sep 81, 53p Rept no. CRREL-SR-81-20

The possibility of modern warfare being waged under cold weather conditions has raised questions about the effectiveness of conventional and new mine systems during the winter. A workshop on mine/countermine winter warfare was held at the U.S. Army Cold Regions Research and Engineering Laboratory, 21-23 October 1980, to define problems related to cold climates. The designer, developer and user communities sent 22 representatives from 16 organizations outside of CRREL. Discussion papers were prepared by four groups, covering emplacement of mines, mine performance, detection of mines, and neutralization of mines. The emphasis was on the unique problems of the winter environment. It appears that the U.S. has the capability to conduct defensive warfare during the summer but is not adequately prepared for mine/countermine winter warfare. Test and research programs are called for to compensate for the prior lack of consideration of the winter environment, to adequately winterize new mine/countermine systems, and to formulate appropriate doctrine for defensive winter warfare. (Author)

AD-A107 075/4 PC **A03**/MF **A01**
Army Russian Inst., APO New York 09053.
The Soviet View of Local Wars and Wars of National Liberation: Strategy and Concepts of Employment.
Research rept.,
Edward S. Pusey. Jun 81, 26p Rept no. 2291

The Soviet view of local wars and wars of national liberation is examined. The author describes the Soviet theoretical premises for causes of these wars and their role in the foreign policy of the Soviet Union. Using Soviet sources, the author describes the historical course of local wars and wars of national liberation and the strategy and concepts of employment that the

Soviet Union intends to use to insure victory in a timely manner. He concludes that the local war, or the national liberation war, from the Soviet point of view, is and will continue to be a viable foreign policy option for the Soviet Union.

AD-A107 076/2 PC **A11**/MF **A01**
CACI, Inc.-Federal, Arlington, VA.
Wartime Requirements for Ammunition Materiel and Personnel (WARRAMP). Volume I. Materiel Postprocessor User's Manual.
Final rept. Sep 80-Aug 81,
Scott Cantlon, and Ronald G. Rhoades. Aug 81, 247p CAA-D-81-2
Contract MDA903-80-D-0668
See also AD-B058 576L.

This manual provides information on the use and application of the 19 programs that comprise the Materiel Postprocessor (MPP) of the Wartime Requirements for Ammunition, Materiel and Personnel (WARRAMP) methodology. This manual provides a general overview of the methodology system followed by a user-level discussion of each program. The discussion includes a general description, data base, input and output sample program runstream for applications on the UNIVAC 1100/82 installed at the US Army Concepts Analysis Agency. (Author)

AD-A107 291/7 PC **A02**/MF **A01**
Army Field Artillery School, Fort Sill, OK.
Terrorism; A Bibliography of Books and Periodical Articles.
Final rept.,
Lester L. Miller, Jr. 2 Nov 81, 12p Rept no. SB-80

This bibliography deals with the subject of terrorism which is the use of fear and violence to intimidate and thus coerce an individual or group for some political or societal goal. It is the latest in a long list of subject terms which have historically described such activity. Terms like guerrilla, insurgent, and revolutionist are included. As to its military application these include counterinsurgency, guerrilla, international terrorism, limited, revolutionary, or unconventional warfare. This number is arranged in two parts. Part one lists books. Part two 'A' lists periodicals by an arbitrarily devised acronym. Part two 'B' contains citations to periodicals by the acronym. Selection has been made from various materials owned by the Morris Swett Library. Inclusion of an item, or omission, does not imply USAFAS indorsement or sanction of the compiler's point-of-view. (Author)

AD-A107 532/4 PC **A08**/MF **A01**
System Development Corp., Santa Monica, CA.
Development of Data Processing Strategies for Potential Application in the Tactical Operations Systems (TOS) and Other Tactical Data Systems.
Final rept. 8 Feb 78-7 Feb 79,
Robert N. Parrish, and Gordon W. Stevens. 7 Feb 79, 175p SDC-TM-6257/000/00, ARI-RN-80-33
Contract DAHC19-77-C-0018

Discussed are improved procedures/data processing methodologies for forecasting battlefield personnel attrition and for reporting logistics status. Two active Army divisions provided information vis-a-vis how the two lattermentioned functions now are performed manually. This information provided the basis for the development of a data processing strategy concept which, if implemented in an automated tactical data system, should greatly improve the accuracy and timeliness with which the functions addressed can be performed. An experiment conducted with Command and General Staff College students confirmed that the timeliness and accuracy of the target functions would be significantly improved.

16.

MISSILE TECHNOLOGY

16C. Missile Warheads and Fuses

AD-A107 536/5 PC **A06**/MF **A01**
Grumman Aerospace Corp., Bethpage, NY.
Process for Fragment Layup, Filler Application, and Outer Coating for PATRIOT GM Warhead M248.
Final rept.,
Julian Z. Starostecki. Oct 81, 124p ARLCD-CR-81047, AD-E400 724
Contract DAAK10-79-C-0376

A mechanized production 'dry' system was developed with capability to layup steel fragments onto warheads metal parts assembly, to replace the currently used 'wet layup' process. The mechanized process decreases dependence on scarce skills, increases producibility, and makes quality controls more manageable. Three layers of steel fragments (1/4-in. (6 mm) cubes) are laidup with epoxy adhesive. Each layer is spirally wrapped and contains over 7,000 continuous fragments. The Grumman-developed Integrated Autowrap System includes the following features: (1) a tape adhesive for chaining the fragments and adhering them to the warhead, and (2) a Gruman redesigned, fragment chain-wrap mechanism with hopper feed that aligns the fragments on the tape adhesive. The chain-wrap mechanism follows a spiral path to layup the fragments on the warhead ogive. This mechanized layout capability eliminated the need for the glass fabric-reinforced epoxy overwrap, the manual skill for spreading epoxy adhesive over the bonding surfaces, and three separate 12-hr room-temperature cures (one for each of the fragment layers). The Autowrap System made it convenient to accomplish 100% inspection of the positioned fragments prior to adhesive curing and improved the dimensional and weight controls for the PATRIOT Warhead Inert Parts Assemblies. (Author)

16D. Missiles

AD-A107 426/9 PC **A02**/MF **A01**
Foreign Technology Div., Wright-Patterson AFB, OH.
China's Ballistic Missile Plans,
Ma Ke, and Wei De Yuan Zuo. 15 Oct 81, 11p Rept no. FTD-ID(RS)T-0721-81
Edited trans. of Hangkong Zhishi (China) n4 Apr 81, by Wang Chen.

No abstract available.

AD-A107 480/6 PC **A05**/MF **A01**
Harry Diamond Labs., Adelphi, MD.
Scale Modeling for the PATRIOT Electromagnetic Pulse Test.
Technical memo.,
Andrew A. Cuneo, Jr., and James J. Loftus. May 81, 99p Rept no. HDL-TM-81-16

Experimental electromagnetic coupling studies were made of a scale model of the PATRIOT air defense system as part of the evaluation of this system's ability to survive exposure to an electromagnetic pulse (EMP). This exercise was primarily concerned with providing basic information this is either too costly and time consuming or impossible to obtain in a full-scale field operation. This basic information consists of the answers to such questions as these: how the external receptor currents change with variations of the incident field's azimuthal and elevation angles as well as polarization, what the effect of cable routing is on EMP coupling, and how critical the system grounding is to EMP protection.

AD-A107 505/0 PC **A03**/MF **A01**
Army Test and Evaluation Command, Aberdeen Proving Ground, MD.
Missile Safety Qualification of Short Range Air Defense (SHORAD) Missiles.
Final rept. on test operations procedure.
23 Sep 81, 32p Rept no. TOP-5-2-619

This Test Operating Procedure (TOP) provides procedures for safety qualification (SQ) testing of short range air defense (SHORAD) missiles during Development Testing (DT I, II, III) and First Article Initial Production Tests (FA-IPT). Safety qualification tests may be conducted on pre-production missile configurations to support safety releases for operational tests. It is essential that safety qualification tests be conducted on production configuration rounds, on production items from a new vendor, and on first items produced after a production line has been idle 6 months or longer. These tests are also applicable to Product Improvement Programs when changes are made to warhead, missile rocket motor assembly, or other components which could affect stockpile-to-launch safety. Tests conducted in accordance with this TOP are limited to missile only and intended to be conducted on complete tactical SHORAD missile rounds except as noted.

AD-A107 519/1 PC **A07**/MF **A01**
BDM Corp., Albuquerque, NM.
An Approach for Assessing Missile System Dormant Reliability.
Final rept. May 80-Jan 81,
Richard D. Trapp, Robert R. Graber, William D. Farmer, and Ronald A. Luhks. 30 Jan 81, 150p Rept no. BDM/A-81-016-TR
Contract F29601-79-C-0051
See also Rept. no. BDM/TAC-80-629-TR.

This report investigates the effects of dormancy on missile systems/subsystems, identifies current dormant reliability prediction methodologies, and provides an approach for assessing dormant reliability and the effects of dormancy on missile systems. The approach is primarily for use in the early phases of missile system development and operational test and evaluation. (Author)

17.

NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

17A. Acoustic Detection

AD-A106 988/9 PC **A02**/MF **A01**
Naval Ocean Systems Center, San Diego, CA.
Source Ranging by a Single Array in a Multipath Ocean.
Research rept. Oct 79-Sep 80,
J. A. Neubert. Apr 81, 16p Rept no. NOSC/TR-681

The objective of this work was to develop a possible way of source ranging by a single array in a multipath ocean and to indicate its limitations. It was shown that mean-square sound-level fluctuations for a single sensor in a random multipath environment are directly dependent on the source range. When this was applied to an array of sensors, the result showed that a single horizontal line array might track a moving source in a multipath ocean environment. This result would facilitate the inter-array communication problem for coherent multi-array processing (CMAP) tracking of submarines. It is recommended that this tracking method be further tested with even more suitable data.

AD-A107 070/5 PC **A04**/MF **A01**
Naval Underwater Systems Center, Newport, RI.

Underwater Target Tracking Using Measurements from a Linear Array of Omnidirectional Acoustic Elements.
Technical rept.
22 Oct 81, 63p Rept no. NUSC-TR-6010

Tracking of underwater targets using measurements from a geometrically linear array of omnidirectional acoustic elements is a nonlinear estimation problem. The technique constructed and used in this report is an iterative, least-squares algorithm which uses the modified Gauss-Newton method. In this algorithm the search direction is found by applying a Householder transformation to the Gauss-Newton equations; the size of the step in this direction is found by minimizing a polynomial approximation to the performance index. The results show: the sign on the estimate of the target's depth cannot be uniquely determined, the Gauss-Newton method works as well as its modified version for these experiments, the problem is singular on the first leg, and the initialization of the algorithm influences convergence. (Author)

AD-A107 281/8 PC **A02**/MF **A01**
Carnegie-Mellon Univ., Pittsburgh, PA. Robotics Inst.
Sonar Image Processing. An Application of Template Matching through Relaxation.
Interim rept.,
Charles E. Thorpe. 9 Oct 81, 12p Rept no. CMU-RI-TR-81-6
Contract N00014-81-K-0503

This paper discusses the use of high-level templates and relaxation techniques in processing side-scan sonar images. The images examined do not have enough resolution to identify the objects individually. Distances and orientations among groups of objects are stable, however, and provide the information necessary to unambiguously identify each object. The identified targets are then used to provide navigation information for underwater vehicles. Much of the work described is an application and refinement of established techniques, most directly those of Davis. Low-level filtering, template matching, relaxation and M* search are all discussed. (Author)

17B. Communication

AD-A106 906/1 PC **A02**/MF **A01**
California Univ., Los Angeles. Dept. of System Science.
Quadratic-Exponential Moment Error Bounds for Digital Communication Systems.
Technical rept.,
Kung Yao. Sep 81, 9p Rept nos. UCLA-ENG-81-30, TR-18
Contract N00014-76-C-0875
Pub. in Jnl. of Franklin Institute, v310 n6 p365-371, Dec 80.

No abstract available.

AD-A106 910/3 Not available NTIS
Stanford Univ., CA.
Multichannel Adaptive Filtering for Signal Enhancement,
Earl R. Ferrara, Jr., and Bernard Widrow. 25 Mar 80, 5p
Contracts N00014-76-C-0929, N00019-80-C-0483
Sponsored in part by Grant NSF-ECS78-8526.
Availability: Pub. in IEEE Transactions on Circuits and Systems, vCAS-28 n6 p606-610 Jun 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 052/3 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Communications through a Randomly Dispersive Incoherent Optical Channel.
Journal article,
Vincent W. Chan. 1981, 5p JA-MS-5536, ESD-TR-81-244
Contract F19628-80-C-0002

No abstract available.

AD-A107 055/6 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Simulation and Development of a PCSFSK Demodulator.
Journal article,
Leslie N. Weiner. 14 Jun 81, 7p MS-5648, ESD-TR-81-245
Contract F19628-80-C-0002
Pub. in Proceedings of the International Conference on Communications, p20.4.1-20.4.6 Jun 81.

No abstract available.

AD-A107 059/8 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Technology Assessment for Future EHF MILSATCOM Systems.
Journal article,
David J. Frediani, Mark L. Stevens, and Stephen L. Zolnay. 14 Jun 81, 8p MS-5667, ESD-TR-81-247
Contract F19628-80-C-0002
Pub. in Proceedings of the International Conference on Communications, p36.2.1 - 36.2.7 Jun 81.

No abstract available.

AD-A107 063/0 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
The Spectral Envelope Estimation Vocoder.
Journal article,
Douglas B. Paul. 31 Jan 80, 10p JA-5045, ESD-TR-81-260
Contract F19628-80-C-0002, ARPA Order-2006
Pub. in IEEE Transactions on Acoustics, Speech, and Signal Processing, vASSP-29 n4 p786-794 Aug 81.

No abstract available.

AD-A107 119/0 PC **A03**/MF **A01**
White Sands Missile Range, NM. Instrumentation Directorate.
IRIG-TIME Synchronized Binary Video Data Inserter.
Final rept.,
Federico Salvatti, Jr. Sep 81, 28p Rept no. STEWS-ID-81-2

The Binary Video Inserter (BVI) was developed to insert binary data into a video signal. A Video Synchronizer was developed to synchronize the BVI to IRIG-B range time. The combination provides a Synchronized Binary Video Inserter (SBVI) in support of a program to replace film-based mobile cinetheodolite instrumentation presently in use at WSMR. The SBVI satisfies the following objectives: synchronizes shuttered video cameras to IRIG-B time; provides timing and control signals to achieve high frame rate capability for recording launch area and miss distance event data; insert time, instrument encoder data, and other data into the video signal for computer-assisted processing; and provide error recovery capability for the inserted data. (Author)

AD-A107 140/6 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.
Flow Control and Routing Techniques for Integrated Voice and Data Networks,
Oliver C. Ibe. Oct 81, 29p Rept no. LIDS-P-1153
Contract N00014-75-C-1183, ARPA Order-3045

We consider a model of integrated voice and data networks. In this model the network flow problem is formulated as a convex optimization problem. The objective function comprises two types of cost functions: the congestion cost functions, which limit the average input traffic to values compatible with the network conditions; and the rate limitation cost functions, which ensure that all conversations are fairly treated. A joint flow control and routing algorithm is constructed which determines the routes for each conversation, and effects flow control by setting voice packet lengths and data input rates in a manner that achieves optimal tradeoff between each user's satisfaction and the cost of network congestion. An additional congestion control protocol is specified which could be used in conjunction with the algorithm to make the latter respond more dynamically to network congestion. (Author)

AD-A107 186/9 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Mission Analysis and Acquisition Div.
FAA's Communications Equipment Replacement Plans.
29 Jul 81, 3p Rept no. GAO/MASAD-81-37

A review of the Federal Aviation Administration's (FAA's) voice communications equipment replacement plans were completed. FAA had planned a two-phased effort to replace the existing leased telephone switching and FAA-owned radio control equipment. Some equipment would be replaced during the early 1980s with interim off-the-shelf leased or purchased equipment while the follow-on Voice Switching and Control System VSCS was being developed. We felt VSCS was not required because (1) hard-wired and patch panel controlled equipment, rather than computer controlled equipment, would satisfy the circuit reconfiguration requirement, (2) much of the in-use equipment would last for many years, and (3) the replacement of older equipment with off-the-shelf equipment, rather than VSCS, would be more cost effective. Accordingly, we recommended that you direct FAA to (1) discontinue research and development on VSCS and cancel its planned purchase; (2) use the planned interim buy off-the-shelf equipment to obtain needed equipment to meet new requirements and replace equipment no longer cost or operationally effective; and (3) revise the draft specifications for the interim equipment to allow more competition and the selection of the lowest cost equipment (hard-wired, patch panel controlled, or computer controlled equipment).

AD-A107 254/5 PC **A12**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Analysis of Flow Behavior Within An Integrated Computer-Communication Network,
Carroll Ardee Clabaugh. May 79, 272p Rept no. AFIT-CI-79-213D

This research concerns itself with the flow behavior in a computer-communication network that integrates data and voice classes of traffic. This behavior is analyzed as a queueing problem by modeling nodes and channels and evaluating their behavior under different arrival rates. Switching mechanisms, flow control considerations, and the development and use of simulation and analytical models are emphasized. Prominent flow control strategies are classified into a framework for potential utility as regulating controls in an integrated environment. An event-driven FORTRAN network simulator is developed based on common call management, traffic integration on trunk lines, and an underlying circuit switched communications subnet. The network simulator is a cost-effective portable tool that has application in an environment where computer resources are limited. An algorithm is formulated that permits decomposition of the network into nodal configurations. A FORTRAN program is developed that implements this algorithm.

AD-A107 266/9 PC **A03**/MF **A01**
Air Force Academy, CO.
Digital Signal Sorting for Digitized Speech in an Environment of Common Digital Data Signals.
Final rept.,
Roger E. Salters. Jan 80, 35p Rept no. USAFA-TR-80-5

This report discusses a digital signal sorting technique for identifying digitized speech signals in an environment of common digital data signals. The technique is modular in that two levels of recognition are possible: (1) a linear prediction based scheme which provides a fine-grain recognition; and (2) a digital word synchronization scheme which provides a coarse, or first cut recognition. In the fine-grain scheme, a discrimination measure defined herein is shown to provide good sorting of the digitized speech sequence - this is demonstrated through examples. (Author)

AD-A107 297/4 PC **A05**/MF **A01**
Vector Research, Inc., Ann Arbor, MI.
Guidelines for Managing the Flow of Information in an Automated Battlefield Command and Control System.
Research rept. May 79-May 80,
Cathleen A. Callahan, Robert W. Blum, Gary Witus, and Mark Graulich. May 80, 90p VRI-ARI-3-FR80-2, ARI-RR-1248
Contract DAHC19-78-C-0027

This report documents research directed towards the development and evaluation of guidelines for Standing Operating Procedures (SOP) for managing information flow in automated battlefield command and control systems. This research was performed during the second phase of a project to develop information management concepts and procedures for tactical operations systems. Three stages of SOP guideline development are discussed: (a) identifying critical problems; (b) developing candidate management procedures to address the critical problems; and (c) evaluating the

efficacy and side effects of the candidate procedures. (Author)

AD-A107 303/0 PC **A07**/MF **A01**
Defense Communications Engineering Center, Reston, VA.
Application of Digital Troposcatter to the DCS.
Technical rept.,
J. L. Osterholz, and W. J. Cybrowski. Sep 80, 148p
Rept no. DCEC-TR-10-80

A DCS digital troposcatter requirements and technology baseline is presented for use by system planners and managers. The current troposcatter link inventory is reviewed to identify those links most likely to be digitized and retained through the 1990's. Current developments in digital troposcatter technology are reviewed, including the results of key tests. Provisional design criteria which were developed for digital troposcatter links based on this testing are presented. This report supersedes draft DCEC TR 17-76, 'Integration of Digital Troposcatter into the Defense Communications System' and draft DCEC TR9-79, 'Application of Digital Troposcatter to the DCS'. (Author)

AD-A107 329/5 PC **A07**/MF **A01**
Vector Research, Inc., Ann Arbor, MI.
Guideline Development for Summarization of Tactical Data.
Interim rept. 15 Mar 79-15 May 80,
Michael G. Samet, and Ralph E. Geiselman. May 80, 138p ARI-TR-458
Contract DAHC19-78-C-0027
Prepared in cooperation with Perceptronics, Inc., Woodland Hills, CA, Rept. no. PDFTR-1083-80-5.

The present study was conducted to validate and expand the generalizability of a set of guidelines for summarizing tactical message content, and to develop guidelines for conducting a manual purge of a message file. Thirty-two Army staff officers studied a scenario and 30 enemy-situation-data (ESD) messages describing an enemy defensive operation. Their task was to summarize the tactical information in the form of an intelligence briefing. Half the officers were supplied with three general guidelines to follow in preparing the summary: (1) provide an interpretation of the data, (2) give a dynamic portrayal, and (3) use conversational style. After the summarization task, the participants were asked to delete 15 of the 30 messages and to rank-order the rest on the basis of importance. The 32 summaries were evaluated by seven military raters in terms of quality of content, interpretation, accuracy, organization, and style. The raters judged the summaries prepared with the aid of the guidelines to be significantly 'better' summaries on an overall evaluation scale and on four of five qualitative scales. Potent positive effects were revealed for all three guidelines. The ten summaries that received the highest overall evaluations were used to derive a general suggested outline for describing the message content.

AD-A107 372/5 PC **A02**/MF **A01**
Defense Mapping Agency Hydrographic/Topographic Center, Washington, DC.
The Worldwide Navigational Warning Service,
J. E. Ayers, and John P. Lyall. 1981, 14p

In the early 1970's both the International Hydrographic Organization (IHO), an intergovernmental agency dedicated to the improvement of nautical charting, an the Intergovernmental Maritime Consultative Organization (IMCO), a U.S. agency dedicated to safety of life at sea, became concerned over the lack of a coordinated worldwide radio service to keep deep sea mariners aware of hazards to navigation. Through their joint efforts the Worldwide Navigational Warning Service (WWNWS) was established, becoming fully operational on 1 April 1980. The WWNWS covers all international shipping routes through a system of 16 NAVAREA Broadcasts, all of which transmit warnings in English (the primary language of the NAVAREA II broadcast is in French) and some of which transmit warnings also in an additional language. This paper describes the development of the initial WWNWS, the mechanism for service improvement and advances which have been made to date, and improvements foreseen for the future. Specific examples from the broadcast experience of the Coordinator for NAVAREA IV and XII and the Northwest Atlantic and Northeast Pacific NAVAREAs, respectively, are given. (Author)

AD-A107 477/2 PC **A04**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Effect of Operator Mental Loading on Voice Recognition System Performance.
Technical rept.,
Gary K. Poock, and J. W. Armstrong. Aug 81, 60p
Rept no. NPS55-81-016

This report describes an experiment in which military officers used voice recognition under various mental loading conditions. Results showed voice recognition performance degraded as mental loading was imposed on the subjects. (Author)

N82-11279/8 PC **A11**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
The Telecommunications and Data Acquisition Report.
Progress Report, Jul. - Aug. 1981.
N. A. Renzetti. 15 Oct 81, 244p NASA-CR-164939, TDA-PR-42-65
Contract NAS7-100

No abstract available.

N82-11337/4 PC **A02**/MF **A01**
Communications Research Centre, Ottawa (Ontario).
Design Methodology and Development History of an ISO OSI Layered Architecture for the Canadian Broadcast Telidon System.
M. Sablatash, and R. Fitzgerald. Aug 81, 24p CRC-TN-708-E

To enable the Telidon System to be compatible with many other data communications devices, systems and networks, a layered protocol logically and conceptually consistent with the International Organization for Standardization's (ISO's) Reference Model for Open Systems Interconnection (OSI) was designed. The features and functions of the proposed design example are described. The protocol control information for each of the seven layers is described by giving specifications for services and functions provided in each layer, and additional descriptions and definitions as required. A general methodology for the design of ISC OSI layered information systems is briefly described.

N82-11340/8 PC **A03**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Telecommunications in Cometary Environments.
W. L. Flock. 1 Jul 81, 43p NASA-CR-164956, JPL-PUB-81-84

Propagation effects on telecommunications in a cometary environment include those due to dust, the inhomogeneous plasma of the coma and tail, and ionization generated by impact of neutral molecules and dust on the spacecraft. Attenuation caused by dust particles is estimated to be on the order of 10 to the minus 5th power dB for the Halley Intercept Mission. Ionization generated by impact on the spacecraft is estimated to result in an electron content of 10 to the 12th power to 10 to the 13th power el/sq meters (3 eV electrons) along the telecommunications path. An estimate of the electron content due to Comet Halley itself is 10 to the 16th power to 10 to the 17th power el/sq meters, compared to a content of 10 to the 16th power to 10 to the 18th power el/sq meters for the Earth's ionosphere and 10 to the 17th power to 10 to the 18th power el/sq meters for the interplanetary medium. The electron content of the plasma near Comet Halley will cause excess range delay, and a Doppler shift of the signal from the spacecraft will occur in propagation to the rate of change of the path elrectron content. It is recommended that S and X down-link frequencies by employed to monitor the path electron content and amplitude scintillation and spectral broadening of the received signals. These measurements will provide a quantitative base of knowledge that will be valuable for radio science and telecommunications system design purposes.

N82-11341/6 PC **A05**/MF **A01**
California Inst. of Tech., Pasadena.
Modulation/Demodulation Techniques for Satellite Communications. Part 4: Appendices.
J. K. Omura, and M. K. Simon. 1 Nov 81, 94p NASA-CR-164954, JPL-PUB-81-73
Contract NAS7-100

The use of the Viterbi algorithm in a general context is examined. The generalized transfer function bounds are given which permit the following applications to be carried out: maximum likelihood demodulation of such bandwidth modulations as minimum-shift-keying and continuous phase frequency-shift-keying, demodulation of intersymbol interference and partial response signals, estimation and smoothing, and simultaneous phase synchronization, and data detection. Sufficient conditions are reviewed for tightening Chernoff and Rhattacharyya bounds.

PB82-128976 PC **A06**/MF **A01**
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
The Federal Side of Traditional Telecommunications Cost Allocations,
Anthony G. Oettinger, and Carol L. Weinhaus. c1980, 125p PUB/P-80-1

Whatever the outcome of legislative proposals before the 96th Congress, the structure of the telecommunications industry and its neighbors is being debated and will continue to be debated in numerous regulatory proceedings, court cases, federal and state legislative initiatives and international negotiations. Central to these discussions are 'proper costs' and their relationships not only to prices but also to other benefits or burdens. Costs have been allocated in the traditional telecommunications industry mainly by a two-stage process. First, explicit jurisdictional separations have allocated costs hence revenue requirements among the federal and all the state jurisdictions. Second, pricing rather than costing policy has determined the further incidence of benefits and burdens in the general absence of explicit suballocations of costs within the pools of costs assigned to the broad aggregates of interstate and state services. This part deals mainly with the first stage. (Copyright (c) 1980 by President and Fellows of Harvard College.)

PB82-128984 PC **A07**/MF **A01**
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
The States Regulate Cable: A Legislative Analysis of Substantive Provisions,
Philip R. Hochberg. c1978, 147p PUB-P-78-4
Grant NSF-APR76-04827
Prepared in cooperation with Kalba Bowen Associates, Inc., Cambridge, MA.

At present, eleven states regulate cable television under comprehensive statutory programs which fall into three distinct patterns: regulation by the existing Public Utility Commission, a 'hybrid' arrangement which consists of a Cable Television Office within a PUC, and separate Cable Television Commissions. Substantive portions of cable statutes under all of these schemes are analyzed including the definition of CATV systems, general and specific powers of the agency, franchising standards, technical provisions, rate oversight, ownership, channel usage, and other provisions of cable regulatory statutes. States without comprehensive jurisdiction are also examined. (Copyright (c) 1978, Konrad K. Kalba.)

PB82-128992 PC **A07**/MF **A01**
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
Taxation, Regionalization and Pole Attachments: A Comparison of State Cable Television Policies,
Larry S. Levine, Konrad K. Kalba, and Philip R. Hochberg. c1978, 134p
Grant NSF-APR76-04827
Prepared in cooperation with Kalba Bowen Associates, Inc., Cambridge, MA.

Policy outputs evolving from day-to-day administration of state cable television statutes and laws are examined in three issue areas: the tax environment in both regulating and non-regulating states; regionalization through line extension, interconnection, districting and case-by-case adjudication; and the pole attachments issue, including a history of state and federal involvement, the 1978 California pole statute, and implications of the 1978 federal legislation. The three studies are assessed in relation to several cross-cutting questions: (1) the extent of administrative flexibility in implementing state statutes; (2) the degree of convergence or divergence in policy approaches among states; and (3) the changing nature of state involvement in cable. (Copyright (c) 1978, Konrad K. Kalba.)

PB82-129008 PC **A06**/MF **A01**
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
The Regulation of Cable Television Subscriber Rates by State Commissions,
Larry S. Levine. c1978, 103p PUB-P-78-6
Grant NSF-APR76-04827

Prepared in cooperation with Kalba Bowen Associates, Inc., Cambridge, MA.

The traditionally conceived concerns of stakeholders in the rate regulation game, i.e. prevention of consumer 'gouging' by a monopolistic business v. overregulation by bureaucrats understanding little about the cable industry, are examined. Specific issues confronting these players, including whether or not there should be rate regulation at all, and if so, what form regulation should take, which systems and rates should be regulated, etc., are analyzed. The rate base rate-of-return method of regulation, as well as possible alternatives such as the common tariff procedure and 'cost of living' adjustments, are assessed and some new insights concerning how cable-related stakeholders (i.e. cable operators, state regulators, municipalities, etc.) view state rate regulation are offered. (Copyright (c) 1978, by Konrad K. Kalba.)

PB82-129016 PC **A05**/MF **A01**
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
The Economic Impact of State Cable TV Regulation,
Yale M. Braunstein, Konrad K. Kalba, and Larry S. Levine. c1978, 86p PUB-P-78-7
Grant NSF-APR76-04827
Prepared in cooperation with Kalba Bowen Associates, Inc., Cambridge, MA.

This study describes the results of several econometric analyses of the effects of state cable television regulation on subscriber rates charged, penetration rates and ownership patterns. Data including age of the cable system, channel capacity, per capita income of the system community, number of off-the-air signals received in the community and system ownership were collected for a sample of 653 cable systems in 1971, 1974, and 1976. Results show that subscriber rates charged by systems in regulating states tended to be higher than rates charged by systems in states without state level regulation (although this difference had changed by 1976). Several explanations for this finding are discussed, including: the cost of regulation, geographic cost differences and management efficiency incentives. Other results show that comprehensive state regulation does not have a significant effect on: system penetration rates, growth of penetration and ownership patterns. A number of alternative definitions of penetration and ownership are described in relation to future research possibilities in this area. (Copyright (c) 1978, Konrad K. Kalba.)

PB82-129024 PC **A03**/MF **A01**
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
Federal Preemption of State Regulation in Cable Television,
Philip R. Hochberg. c1978, 49p PUB-P-78-8
Grant NSF-APR76-04827
Prepared in cooperation with Kalba Bowen Associates, Inc., Cambridge, MA.

An overview of federal jurisdiction preemption over cable television regulation is presented. The history of federal assertion of jurisdiction is examined, emphasizing its impact on states, statutory preemption, regulatory preemption, and case law affecting authority over cable. Judicial decisions leading to the Federal Communications Commission Cable Television Report and Order in 1972 are reviewed, and subsequent decisions both upholding and denying federal jurisdiction are analyzed. The future of federal preemption is considered in light of current court and FCC decisions, as well as the introduction of congressional legislation dealing directly with federal preemption. (Copyright (c) 1978, Konrad K. Kalba.)

PB82-129032 PC **A03**/MF **A01**
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
Chronology of Cable Television Regulation: 1947 - 1978,
Anne E. Birinyi. c1978, 28p PUB-P-78-10
Grant NSF-APR76-04827
Prepared in cooperation with Kalba Bowen Associates, Inc., Cambridge,MA.

A chronological and contextual matrix is presented illustrating the evaluation of cable television regulation as it presently exists. Among the elements which have shaped current cable TV regulation are decisions made by state legislatures, state courts, and state regulatory agencies. These are shown along with decisions of the federal courts and the Federal Communications Commission in order to reflect the concurrent emergence of state and federal involvement in cable regulation. The advancement of the cable industry itself is charted in order to show the impacts of industry progress on both state and federal level decisions and attitudes. In addition, important position statements of stakeholders and study groups interested in cable, such as the National Association of Regulatory Utility Commissioners (NARUC), the House Subcommittee on Communications, and the Sloan Commission on Cable Communications, are included to represent the progression of cable television regulatory philosophies during the thirty-year period from 1947 to mid-1978. (Copyright (c) 1978, Konrad K. Kalba.)

PB82-129040 PC **A02**/MF **A01**
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
Executive Summary of Findings of the State Cable Television Regulation Project,
Konrad K. Kalba, Larry S. Levine, Yale M. Braunstein, and Philip R. Hochberg. c1978, 25p PUB-P-78-11
Grant NSF-APR76-04827
Prepared in cooperation with Kalba Bowen Associates, Inc., Cambridge, MA.

The state cable television regulation project addresses the political dynamics, legal options, regulatory issues and economic impacts of state government involvement in cable television. (Copyright (c) Konrad K. Kulla 1978.)

PB82-129057 PC **A04**/MF **A01**
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
The Role of Communications and Information Resources in Canada,
Oswald H. Ganley. c1979, 74p PUB-P-79-1

This paper looks at the entire range of communications and information matters in terms of underlying political, economic and social forces in Canada with special emphasis on Canada's three main concerns: Unity, Economic Viability and Cultural Identity. It is intended to serve as a base for future examination of U.S.-Canadian communications and information relationships.

PB82-129073 PC **A04**/MF **A01**
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
Private and Public Defenses Against Soviet Interception of U.S. Telecommunications: Problems and Policy Points,
Greg Lipscomb. c1979, 75p PUB-P-79-3

The Soviet Union is listening in on American domestic long distance telephone calls, apparently seeking strategic economic information. While the Carter Administration has decided not to interfere directly, it has formed a White House task force charged with frustrating this Soviet practice. The author discusses the problems of securing private industry communication. Should equipment be compatible, and thus vulnerable to questions of privacy and trust. Or should each system be individualized, a distinct inconvenience to mobile corporate executives. Who should bear the costs, the general taxpayer or the corporate consumer.

PB82-129081 PC **A05**/MF **A01**
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
Compunications Network Management,
Robert H. Klie. c1981, 82p PUB-P-80-4

How growing competition will influence the effectiveness and efficiency of compunications facilities or services is a controversial matter of some importance to both clients and suppliers of these facilities or services. Network management is one focus of controversy. To caricature one extreme position on network management, only AT&T's leadership and dominance are up to doing it right. To caricature the other extreme, the invisible hand in an unfettered competitive market can do it better. In order to formulate policy in this area five basic questions must be considered: manage what, why, how, to what extent, and at what cost. In this paper, the author addresses the questions what and why in the belief that better understanding and perhaps agreement on these points can shed some light on how and how much to manage.

PB82-129099 PC **A03**/MF **A01**
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
The Exchange Network Facilities for Interstate Access (ENFIA) Interim Settlement Agreement: Using Governmentally Sanctioned Negotiating Processes to Coordinate Telecommunications Facilities and Services,
Kurt Borchardt. c1981, 30p PUB-P-79-4

Replacing the traditional adversary process with governmentally-sanctioned negotiation shows great promise for the coordination of telecommunications services and facilities. Under this arrangement, the expense, delay and litigation which often occurs when two competing companies seek to offer complementary services to the public can be avoided. The author examines the particular factors affecting the success or failure of such a process, using as a case in point the 1978 Exchange Network Facilities for Interstate Access (ENFIA) tariff negotiations between the Bell System and Other Common Carriers.

PB82-129107 PC **A09**/MF **A01**
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
The Traditional State Side of Telecommunications Cost Allocations,
Anthony G. Oettinger, and Carol L. Weinhaus. c1980, 184p PUB-P-80-7

Central to the current debates over telecommunications policy are 'proper costs' and their relationships, not only to prices, but also to other benefits or burdens. Costs have been allocated in the traditional telecommunications industry mainly by a two-stage process. First, explicit jurisdictional separations have allocated costs hence revenue requirements among the federal and all the state jurisdictions. Second, pricing rather than costing policy has determined the further incidence of benefits and burdens in the general absence of explicit sub-allocations of costs within the pools of costs assigned to the broad aggregates of interstate and state services.

PB82-130519 PC **A05**/MF **A01**
National Telecommunications and Information Administration, Washington, DC.
Selective Fading on a Long 8 GHz Line-of-Sight Path in Europe.
Technical rept. 1 Feb-30 Dec 80,
L. B. Hause. Sep 81, 97p NTIA/REPORT-81-84
Sponsored in part by Defense Communications Engineering Center, Reston, VA.

This report presents the description, analysis and results of a set of measurements made on a 90 km line-of-sight path in Italy. The measurements were made during the late spring of 1980 by the National Telecommunications and Information Administration under the sponsorship of the Defense Communication Engineering Center, Reston, VA. Received signal level and IF spectrum were measured to obtain statistics about the distortion of the frequency spectrum amplitude during periods of multipath fading. Digital format violation and reframe events were monitored to measure the tolerance of the 3-level-partial-response radios (12.6 Mb/s) to this distortion.

PB82-856964 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Facsimile Communication. June, 1970-1981 (Citations from the NTIS Data Base).
Rept. for Jun 70-Dec 81.
Dec 81, 192p
Supersedes PB80-851074.

This bibliography cites reports that discuss design and applications of facsimile communication systems. Discussions of satellite and telephone networks are included. The use of facsimile communication systems by business, the military, and government is covered. (This updated bibliography contains 157 citations, 32 of which are new entries to the previous edition.)

PB82-858390 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Satellite Receivers. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for Jan 75-Dec 81.
Dec 81, 126p

Supersedes PB81-860652.

Surface located tracking and data aquisition receivers for satellites are discussed in the cited reports. Emphasis is placed on television broadcasting, surface navigation, and meteorology. The design, operation, and testing of a wide variety of microwave receivers are described. (This updated bibliography contains 115 citations, 11 of which are new entries to the previous edition.)

PB82-915200 Standing Order
Federal Communications Commission, Washington, DC.
Common Carrier Land Mobile Base Stations Cumulative Staff Study Listing.
Monthly repts.
1981, 12 issues
All microfiche is 48X reduction. Request current pricing information on standing order or one time sale.

Contains Fiche copies of Common Carrier 'Cumulative Staff Study Listing - Base Station only' (BS only). The Cumulative Staff Study Listing is a report of base station transmitters from the Common Carrier Land Mobile Base Station data base listed by frequency, longitude and latitude. It is supplied on a monthly basis.

17E. Infrared and Ultraviolet Detection

AD-A107 061/4 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Digital Filters for Infrared Target Acquisition Sensors.
Journal article,
Jaoquin J. Otazo, Eleanor W. Tung, and Ronald R. Parenti. 1980, 14p MS-5406, ESD-TR-81-241
Contract F19628-80-C-0002, ARPA Order-600
Pub. in SPIE, v238 p78-90 1980.

No abstract available.

AD-A107 338/6 PC **A04**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Environmental Lab.
Site Characterization for the MBCE/DIRT II Battlefield Environment Tests.
Final rept.,
James B. Mason, and Katherine S. Long. Sep 81, 55p Rept no. WES/MP/EL-81-8
Contract ASL-79-8116

The Munitions Bare Charge Equivalence/Dusty Infrared Test II (MBCE/DIRT II) test series was conducted as a joint field experiment by the Atmospheric Sciences Laboratory and the U.S. Army Engineer Waterways Experiment Station (WES) at White Sands Missile Range, N. Mex., in July 1979. The purpose of the DIRT II portion of the test was to measure the transmission of optical energy through the obscurants generated by explosives interacting with the terrain. This report describes procedures and measurements conducted by the Environmental Laboratory of WES to establish the relevant physical properties of the test site for use in determining the nature and amount of the obscurant material. A portion of this effort was also devoted to the selection and description of a standard set of measurements and sampling procedures for general use in such tests. The resulting set is described along with the rationale behind it. (Author)

AD-A107 490/5 PC **A08**/MF **A01**
Auburn Univ., AL. Engineering Experiment Station.
Automatic Handoff of Multiple Targets.
Final technical rept. 10 Oct 80-14 Sep 81 on Phase 2,
J. S. Boland, III , H. S. Ranganath, and D. V. Satish Chandra. 14 Sep 81, 166p DRSMI/RG-CR-81-4, AD-E950 176
Contract DAAH01-80-C-0258
See also report dated 30 Sep 80, AD-A093 483.

In order to fully utilize the potential of the 'fire and forget' class of helicopter-borne missiles, it is necessary to solve the technical problems associated with acquiring and handing off multiple targets from a precision pointing and tracking system (PTS) to several missile seekers simultaneously or almost so in a short period of time. The multiple target problem is that of locating targets and missile seeker aim points within the PTS field of view, deciding which target is to be assigned to each missile, generating error signals to the torquers in order to slew the missile LOS such that its assigned target is in the center of its FOV, and initiating automatic seeker tracking. The task of locating a given smaller image within a larger image is known as 'image registration'. A detailed comparison of the important multiple image registratin methods based on the number of arithmetic operatins for software implementation and the complexity of hardware for real time implementation is presented. New methods of accomplishing multiple image registration which are computationally more efficient than the most commonly used template matching techniques (correlation and sequential similarity detection algorithm) are described. Several methods are compared with respect to hardware requirements and speed of computation. (Author)

17G. Navigation and Guidance

AD-A106 850/1 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Accounting and Financial Management Div.
Review of Department of Transportation's Response to Recommendations in the Senate Report on the Federal Aviation Administration's En Route Air Traffic Control Computer System.
1 Jun 81, 11p Rept no. GAO/AFMD-81-66

In its report, the Senate investigations staff found that FAA has not effectively managed its en route computerized air traffic control system. Because of weaknesses in reporting equipment outages, lack of planning, and a poorly defined approach to managing system operations and software changes, FAA cannot be certain that the current system will operate at a level that will ensure the safety of the traveling public until the proposed replacement system is operational. The Senate investigations report contained nine recommendations to FAA. The Committee of Conference established reporting milestones for each of the recommendations. Further, the Committee of Conference directed that FAA report its actions on the recommendations to the appropriate committees by specific milestone dates. (Author)

AD-A106 941/8 PC **A09**/MF **A01**
Eclectech Associates, Inc., North Stonington, CT.
Simulator Evaluation of Electronic Radio Aids to Navigation Displays, the RA-1 Experiment.
Interim rept.,
R .B. Cooper, K. L. Marino, and W. R. Bertsche. Jan 81, 183p Rept no. EA-80-U-86
Contract DOT-CG-835285-A

This report describes a ship's bridge simulation evaluation of electronic radio aids to navigation displays conducted for the purpose of trading off display information effectiveness with operational requirements and shipboard system cost. The experiment known as RA-1 is the second of a series of experiments which are addressing DIGITAL, GRAPHIC, PERSPECTIVE and STEERING display formats with various noise and filter characteristics. The first, a miniexperiment of abbreviated length, selected five of the most operationally effective display designs from among 18 original display formats. To these were added two predictor steering displays for a total of seven displays; all to be evaluated in the more stringent, full-length RA-1 simulation. As a result of superior pilotage performance shown in this experiment, a true motion, trackup GRAPHIC display with either course or heading vectors is recommended as the 'benchmark' display for inclusion in a future RA-2 simulation. The RA-2 experiment will evaluate the 'benchmark' display's effectiveness in a radio aids to navigation noise environment and as a function of system filtering characteristics and the implementation of gyro aiding. The simulation of the noise environment and system filtering characteristics is evaluated in this report.

AD-A107 045/7 PC **A08**/MF **A01**
Eclectech Associates, Inc., North Stonington, CT.
Aids to Navigation Principal Findings on the CAORF Experiment. The Performance of Visual Aids to Navigation as Evaluated by Simulation.
Interim rept.,
M. W. Smith, and W. R. Bertsche. Feb 81, 170p EA-80-U-051, USCG-D-51-81
Contract DOT-CG-835285-A

The experiment described in the present report is the first of a series done for the U.S. Coast Guard to quantify the relationship between variables related to aids to navigation and piloting performance in narrow channels, and, therefore, safety in such channels. The present experiment was restricted to visual piloting, and, further, to buoys only. It was done at CAORF, the Maritime Administration's Computer Aided Operations Research Facility in Kings Point, New York. The variables evaluated were: straight channel marking (staggered versus gated buoys), spacing (5/8 versus 1-1/4 nm), turnmarking (one versus three buoys), day/night, detection range (3/4 versus 1-1/2 nm), angle of turn (15 versus 35 degrees), and turn radius (noncutoff versus cutoff). A scenario was planned to include both trackkeeping and maneuvering tasks done both with and without perturbation. The findings are presented as the means and standard deviations of the crosstrack position of transits under each condition. They are interpreted in terms of their implications both for channel design and for an understanding of the piloting process. (Author)

AD-A107 072/1 PC **A06**/MF **A01**
Eclectech Associates, Inc., North Stonington, CT.
Simulator Evaluation of Electronic Radio Aids to Navigation Displays--The Miniexperiment.
Interim rept.,
R. B. Cooper, and K. L. Marino. Sep 80, 122p EA-80-U-88, USCG-D-59-80
Contract DOT-CG-835285-A
See also report dated Dec 79.

This report describes a simulator evaluation of electronic radio aids to navigation displays conducted for the purpose of trading off display information effectiveness with operational requirements and shipboard system cost. The miniexperiment, a predecessor to more lengthy experimentation, utilized an abbreviated scenario to operationally simulate 18 display formats. Six digital, ten graphic, and two perspective displays were evaluated. The digital display was designed to provide trackkeeping and turning information that would enable a pilot to transit the waterway while using an inexpensive digital (alphanumeric or numeric only) display. The graphic display was designed to provide a pictorial representation of ownship in the waterway similar to the way it is viewed on radar, contemporary collision avoidance, or navigation option displays. The perspective display was designed to portray the perspective scene as viewed out the forward bridge windows. Pilot performance using each of the displays is discussed and analyzed, and seven displays were recommended for further evaluation in the full-scale experiment. (Author)

AD-A107 139/8 PC **A03**/MF **A01**
RAND Corp., Santa Monica, CA.
AUTOPILOT: A Distributed Planner for Air Fleet Control.
Interim rept.,
Perry W. Thorndyke, David McArthur, and Stephanie Cammarata. Jul 81, 34p Rept no. RAND/N-731-ARPA
Contract MDA903-78-C-0029

Distributed planning requires both architectures for structuring multiple planners and techniques for planning, communication, and cooperation. We describe a family of systems for distributed control of multiple aircraft, in which each aircraft plans it own flight path and avoids collisions with other aircraft. AUTOPILOT, the kernel planner used by each aircraft, comprises several processing experts that share a common world model. These experts sense the world, plan and evaluate flight paths, communicate with other aircraft, and control plan execution. We discuss four architectures for the distribution of airspace management and planning responsibility among the several aircraft occupying the airspace at any point in time. The architecture differ in the extent of cooperation and communication among aircraft. (Author)

AD-A107 150/5 PC **A03**/MF **A01**
Army Communications-Electronics Engineering Installation Agency, Fort Huachuca, AZ.
Standard Engineering Installation Package. Air Traffic Radio Channel Control Equipment Change 1.
30 Oct 81, 41p Rept no. USACEEIA-SEIP-036-1
Change 1 to report dated 1 Nov 79, AD-A077 648.

This report contains changes to the Standard Engineering Installation Package (SEIP) which provides information for the engineering and installation of ATRCC (Air Traffic Radio Channel Control) facilities worldwide. Information provided consists of site survey data, siting criteria, installation specifications and instructions, certification format. Information provided must be adapted to the specific ATRCC facility/location by the project engineer.

AD-A107 234/7 PC **A04**/MF **A01**
Facility Checking Squadron (1866th) (AFCS), Scott AFB, IL.
TRACALS Evaluation Report. Airport Surveillance Radar AN/GPN-12. Special Evaluation Report. Salt lake City International Airport and Wendover Auxiliary Airfield, Utah, 3 and 6-15 June 1981.
Final rept.,
James C. Caballero, Jr., and Kenneth M. Slater. 31 Aug 81, 51p Rept no. 81/66S-275

This report presents data collected to define the capabilities and limitations of the radar facility at Wendover AAF, Utah, the microwave remoting, and the indicators at Salt Lake City IAP, Utah. This report includes descriptions of the useable radar coverage and tracking capabilities, analysis of all flight and equipment performance data, and performance predictions for the facility. The data presented can be used for anticipated equipment performance until there is an addition, deletion, or relocation of equipment, or until a significant change occurs in the horizontal profile.

AD-A107 325/3 PC **A02**/MF **A01**
Federal Aviation Administration Technical Center, Atlantic City, NJ.
High-Speed Rotary Printing Device for Air Traffic Control Applications: A Preliminary Evaluation.
Final rept. Aug 80-Apr 81,
Gerard Spanier. Oct 81, 16p FAA-CT-81-59, FAA/RD-81/73

This report describes a unique, high-speed rotary printing device evaluated by the Federal Aviation Administration (FAA) Technical Center to determine potential applicability in air traffic control (ATC) work stations. The report discusses general performance of the unit, basic ATC operational problems being addressed by the study, concepts of application, and future activities for more comprehensive evaluations in simulated and real work station environments. (Author)

AD-A107 327/9 PC **A03**/MF **A01**
Federal Aviation Administration Technical Center, Atlantic City, NJ.
Microwave Landing System Flare Subsystem Test.
Data rept. for period ending Apr 79,
Carl B. Jezierski. Oct 81, 43p Rept no. FAA-CT-81-61

Microwave Landing System (MLS) Flare subsystem performance data were collected on a specially instrumented Federal Aviation Administration (FAA) Technical Center aircraft. The airborne data were compared with a theodolite tracking system reference and error plots generated. Due to extensive lightning damage only two flight tests were performed. Flare subsystem accuracy could not be determined because of insufficient data. (Author)

AD-A107 384/0 PC **A09**/MF **A01**
Auburn Univ., AL. Dept. of Electrical Engineering.
Marine Air Traffic Control and Landing System (MATCALS) Investigation.
Technical rept.,
E. R. Graf, Charles L. Phillips, and Scott A. Starks. Apr 81, 184p
Contract N00039-80-C-0032
Prepared in cooperation with Georgia Inst. of Tech., Atlanta, GA. Engineering Experiment Station.

The report is organized into three main sections, namely Part Two, Part Three, and Part Four. Part Two contains the results of an investigation into replacing the alpha-beta filter in the MATCALS digital controller with an observer, in order to reduce the effects of radar noise. Part Three presents a centroid algorithm based up return amplitude-versus-angle signature. Part Four presents an investigation of adaptive filtering algorithms for the MATCALS system.

AD-A107 396/4 PC **A03**/MF **A01**
Facility Checking Squadron (1866th) (AFCS), Scott AFB, IL.
TRACALS Evaluation Report. VOR Special Evaluation Report, Williams AFB, Arizona, 22-27 July 1981.
Final rept.,
Harvey J. Leister, and Rodney W. Rex. 30 Aug 81, 42p Rept no. 81/66S-280

This report presents the results of the 22-27 July 1981 TRACALS Evaluation of the Williams AFB AN/FRN-38 VOR. the purpose of the evaluation was to establish a new reference checkpoint, to examine the coverage volume for additional areas of unusable signal, and to investigate differences between ground and airborne readings for modulation alignment and error spread. The results presented in this report can be used as a guide for anticipated performance until there is a significant change in either ground equipment or siting environment. (Author)

AD-A107 397/2 PC **A05**/MF **A01**
Facility Checking Squadron (1866th) (AFCS), Scott AFB, IL.
TRACALS Evaluation Report. Solid State Instrument Landing System AN/GRN-29(V) Initial Evaluation Report, Columbus AFB, Mississippi, 7-20 July 1981.
Final rept.,
Wayne E. Bowser, and Mark G. Stillwell. 17 Aug 81, 82p Rept no. 81/66N-278

This report presents the results of the 7-20 July 1981 TRACALS evaluation and commissioning of both Columbus AFB AN/GRN-29 SSILSs. The evaluation was conducted to determine the capabilities and limitations of the systems in their installed environment. Results presented in this report can be used as a guide for anticipated performance until there is a significant change in ground equipment, siting environment, screening or operational use. (Author)

AD-A107 425/1 PC **A03**/MF **A01**
Army Electronics Research and Development Command, White Sands Missile Range, NM. Atmospheric Sciences Lab.
The Effect of Ionospheric Variability on the Accuracy of High Frequency Position Location.
Final rept.,
Melvin G. Heaps. Aug 81, 46p Rept no. ERADCOM/ASL-TR-0095

The attainable accuracies in high frequency (HF) radio wave position location over ranges of several hundred kilometers are beset with errors of tens of kilometers due to constraints in three major areas: ionospheric variability and irregularity; system size limitations for easily fieldable systems; and sufficient data acquisition, processing, and interpretation. Of principal concern here is the area of ionospheric variability and irregularity. The temporal and spatial coherence of ionospheric structure has been considered with respect to its effect on the accuracy of HF position location. The findings show that medium and small-scale ionospheric structures most likely to affect HF position location accuracies have a spatial coherence on the order of 50 km and a temporal coherence on the order of 5 minutes. On this basis it is recommended that a multiple ionosonde net be used instead of a single ionosonde, such that an ionospheric sounding point is no more than 50 km from a potential radio wave reflection point, and that soundings be taken on the order of every 5 minutes or less. (Author)

AD-A107 491/3 PC **A04**/MF **A01**
Facility Checking Squadron (1866th) (AFCS), Scott AFB, IL.
TRACALS Evaluation Report. Airport Surveillance and Precision Approach Radar AN/GPN-24(V), Initial Evaluation Report, RAF Upper Heyford, England 11 Mar-25 April 81.
Final rept.,
Richard M. Fisher, and Merton E. Fisher. 1 Sep 81, 61p Rept no. 81/66R-259

This report presents data collected 11 March - 25 April 1981 to define the capabilities and limitations of the AN/GPN-24(V) Landing Control, Central facility at RAF Upper Heyford, England. This report includes descriptions of the useable radar coverage and tracking capabilities, analysis of all flight and equipment performance data, and performance predictions for the facility. The data presented can be used as a guide for anticipated equipment performance until there is an addition, deletion, or relocation of equipment, or until a significant change occurs in the horizontal profile. (Author)

AD-A107 507/6 PC **A04**/MF **A01**
Facility Checking Squadron (1866th) (AFCS), Scott AFB, IL.
TRACALS Evaluation Report. Communications Initial Evaluation Report, Hill AFB, Utah, 9-15 June 1981.
Final rept.,
Walter E. Kimmel, and Phillip M. Dermody. 9 Sep 81, 56p Rept no. 81/66C-268

A Communications Initial Evaluation was performed at Hill AFB, Utah to define the capabilities and limitations of the ATC backup communications system. Communications coverage from Francis Peak to the test range west of Hill AFB was also evaluated. This report includes analysis of ground equipment measurements and correlation of predicted and measured received signal levels as they affect the communications coverage. This report can be used as a guide for anticipated performance of the evaluated communications systems until there is a deletion, addition, relocation of equipment, or a change in the horizon profile.

N82-11339/0 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
General Aviation Aircraft Antennas for the Global Positioning System.
M. C. Gilreath, and J. S. Chatterjee. Oct 81, 37p NASA-TM-83212

Several antenna designs that utilize the NAVSTAR Global Positioning System in a low-cost system for general aviation aircraft were evaluated. Experimental investigations were made of crossed-dipoles, various types of crossed-slots, and microstrip antennas with modifications to improve their coverage. Principal plane radiation patterns for several of these antennas were measured on a one-seventh scale model of a Gates Lear Jet.

17H. Optical Detection

AD-A107 261/0 PC **A03**/MF **A01**
United Technologies Research Center, East Hartford, CT.
Development of an Electronic Interface for a Fiber Optic Interferometric Sensor.
Final rept. 14 Jul 80-14 May 81,
W. H. Glenn, H. Knickerbocker, and A. P. Weise. May 81, 41p Rept no. UTRC/R81-925261-14
Contract N00173-80-C-0275

This report documents the design, fabrication, and testing of an electronic interface unit for a fiber optic interferometric sensor. The unit is a wide dynamic range, highly linear FM demodulator for the detection of low modulation index FM signals in the presence of large, low frequency interfering signals. Ouputs to drive acousto-optic frequency shifters are provided. The report includes complete parts lists and schematic drawings for two units delivered to the sponsoring agency, Naval Research Laboratory. (Author)

17I. Radar Detection

AD-A106 870/9 MF **A01**
Air Force Systems Command, Washington, DC.
Continental United States Over-The-Horizon-Backscatter (OTH-B) Radar System. Supplement.
Final environmental impact statement.
9 Oct 81, 18p Rept no. AFSC-TR-81-64-SUPPL
Availability: Microfiche copies only.

This supplement amends the Final Environmental Impact Statement issued in January 1975. The action proposed in the 1975 EIS was to construct and operate an OTH-B radar System in Maine, initially covering a 60 degree sector, and later expanded to cover 180 degrees . The action proposed in this supplement is to locate the integrated operations, maintenance, and security facility at Bangor International Airport, a location not considered in the 1975 EIS. Alternatives are locating at Bucks Harbor the maintenance and security personnel who support the Washington County receiver site, but leaving the maintenance and security person-

nel for the operations center and the Somerset County transmitter site with the operations personnel at Bangor International Airport; and not deploying either the 60 degree or the 180 degree system. (Author)

AD-A106 947/5 PC **A04**/MF **A01**
Army Missile Command, Redstone Arsenal, AL. Advanced Sensors Directorate.
Active RF Seeker Analysis for Land Combat Seekers.
Technical rept.,
R. F. Russell, and R. H. Garlough. Apr 81, 55p
DRSMI-RE-81-19-TR, AD-E950 175

This report discusses some analysis techniques which apply to all-weather/day-night missile guidance systems against tank type targets using an RF seeker. Those techniques are examined that may be applied to obtain the proper signal to clutter ratio and terminal accuracy, including squint, polarization and frequency discrimination. (Author)

AD-A106 948/3 PC **A03**/MF **A01**
Army Missile Command, Redstone Arsenal, AL. Advanced Sensors Directorate.
Signal Analysis Van Hardware Operation General Description. Volume 1.
Technical rept.,
L. B. Owen, J. W. Pleasure, and R. K. Cornwell. Dec 81, 42p DRSMI-RE-81-6-TR, AD-E950 174

The Signal Analysis Van is comprised of general-purpose high-speed programmable data acquisition hardware housed within a 45-foot commercial semitrailer equipped with a RF shielded enclosure. The Signal Analysis Van is capable of capturing and storing several channels of high-bandwidth, high-dynamic-range signals typical of many high-performance radar and missile-seeker systems. Programmable features permit fast and accurate interfacing with a variety of sensor systems alleviating the necessity for hardware redesign and modifications as new requirements are generated. (Author)

AD-A106 996/2 PC **A06**/MF **A01**
Atlantic Research Corp., Rome, NY.
Space-Based Radar Array System Simulation and Validation.
Final technical rept. 7 Mar 79-7 Mar 81,
Harvey K. Schuman, Donald R. Pflug, and Larry D. Thompson. Aug 81, 101p RADC-TR-81-215
Contract F30602-79-C-0116

The present status of the space-based radar phased array lens simulator is discussed. Huge arrays of thin wire radiating elements on either side of a ground screen are modeled by the simulator. Also modeled are amplitude and phase adjust modules connecting radiating elements between arrays, feedline to radiator mismatch, and lens warping. A successive approximation method is employed. The first approximation is based on a plane wave expansion (infinite array) moment method especially suited to large array analysis. the first approximation results then facilitate higher approximation computations that account for effects of nonuniform periodicities (lens edge, lens section interfaces, failed modules, etc.). The programming to date is discussed via flow diagrams. An improved theory is presented in a consolidated development. the use of the simulator is illustrated by computing active impedances and radiating element current distributions for infinite planar arrays of straight and 'swept back' dipoles (arms inclined with respect to the array plane) with feedline scattering taken into account. (Author)

AD-A107 065/5 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Bistatic Scattering Reflection Asymmetry, Polarization Reversal Asymmetry, and Polarization Reversal Reflection Symmetry.
Journal article,
Gregory E. Heath. 8 Jun 79, 7p JA-4990, ESD-TR-81-249
Contract F19628-80-C-0002
Pub. in IEEE Transactions on Antennas and Propagation, vAP-29 n3 p429-434 May 81.

No abstract available.

AD-A107 088/7 PC **A05**/MF **A01**
National Telecommunications and Information Administration, Boulder, CO. Inst. for Telecommunication Sciences.
A high-Frequency Broadband Transmitter for Monostatic Systems.
Technical memo.,
Donald H. Layton. Jul 81, 91p Rept no. NTIA-TM-81-59

This report describes the design and fabrication of the broadband amplifier for the San Watch Radar on San Clemente Island. The amplifier is capable of 1400 watts peak output with a maximum duty cycle of 33%. Twenty-seven units were built with a typical amplitude deviation of 0.2 dB. Receiver pre-amplifiers are included in each unit to provide 8 dB of gain to overcome cable and phasing system losses. Each unit is self-cooling and sealed from the salty atmosphere. (Author)

AD-A107 215/6 PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Attenuation Problems Associated with a 5 cm Radar.
Scientific rept.,
Robert H. Allen, Donald W. Burgess, and Ralph J. Donaldson, Jr. 1981, 6p Rept no. AFGL-TR-81-0295
Pub. in Bulletin of the American Meteorological Society, v62 n6 p807-810 Jun 81.

No abstract available.

AD-A107 268/5 PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
Linear Frequency Modulation Derived Polyphase Pulse-Compression Codes and an Efficient Digital Implementation.
Interim rept.,
B. L. Lewis, and F. F. Kretschmer, Jr. 2 Nov 81, 11p Rept no. NRL-8541

In previous publications, the authors introduced a new class of polyphase pulse-compression codes and techniques for use in digitally coded radars. Such codes and compressors can be employed to obtain much larger time-bandwidth products (pulse compression ratios) than are feasible with analog dispersive delay lines. It is the purpose of this report to extend this class to include two new codes, one of which is tolerant of precompression bandwidth limitation. These new phase codes are conceptually derived from a linear frequency modulation waveform (LFMW) and are more doppler tolerant than other phase codes derived from a step approximation to a LFMW. This report will also describe an efficient technique for implementing these new phase codes in a digital pulse-expander-compressor and will present performance data. It should be noted that these phase codes are designed to be used both on transmission and reception to insure that the receive filter matches the transmitted waveform independent of time differences between the leading edge of the echo and a sampling pulse, i.e., independent of target range. The two new phase codes will be called the P3 and P4 codes to distinguish them from the P1 and P2 codes. The P3 code is not precompression bandwidth limitation tolerant, but is much more doppler tolerant than the Frank or P1 and P2 codes. The P4 code is a rearranged P3 code with the same doppler tolerance and with better precompression bandwidth limitation tolerance.

AD-A107 404/6 MF **A01**
Electronic Space Systems Corp., Concord, MA.
Final Electromagnetic Test Report for the M10-76-8000 Radome with XP Plates.
Test rept.
Aug 81, 135p Rept no. TR-81-8
Contract N00173-80-C-0345
Availability: Microfiche copies only.

Contents: Transmission Loss; Sidelobe Perturbation; Beam Width Change; Antenna Beam Symmetry, and Boresight Error. Electromagnetic tests were conducted to evaluate the performance of the M10-76-8000 Radome fitted with special XP plates supplied by the Navy. The tests were run during the last two weeks of August, 1981. The type of tests, equipment employed, test setups and recorded data are contained in this report. This document also contains a list of all chart recordings and a copy of all recordings.

AD-A107 523/3 PC **A07**/MF **A01**
Aeronautical Research Associates of Princeton, Inc., NJ.
Atmospheric Fluctuations Which Lead to Trackable Radar Signals in the Marine Boundary Layer.
Final rept. 1 Aug 80-31 Jul 81,
W. S. Lewellen, H. Segur, R. I. Sykes, and C. P. Cerasoli. Jul 81, 128p Rept no. ARAP-450
Contract N00014-80-C-0873

A description and rough cataloguing of the dominant types of fluid dynamic features which may be expected to yield trackable radar targets in the atmospheric boundary layer is provided. Conditions favorable for target motion relative to the ambient wind velocity are discussed. One particularly interesting type of wave generated target is that involving Kelvin-Helmholtz wave breaking which occurs when a wave of sufficient amplitude passes through a slightly stable fluid shear layer. This type of wave breaking is examined numerically using A.R.A.P.'s second-order closure turbulence model. This normalized computation allows the evolution of the radar pattern for this particular type of event to be interpreted in terms of the temperature, humidity, and velocity across a particular shear zone, and the wave speed of the triggering internal wave.

PAT-APPL-6-284 287 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office.
Synthetic Aperture Radar Target Simulator.
Patent Application,
H. A. Zebker, D. N. Held, R. M. Goldstein, and T. C. Bickler. Filed 17 Jul 81, 15p N82-10286/4, NASA-CASE-NPO-15024-1
Contract NAS7-100
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A simulator for simulating the radar return, or echo, from a target seen by a SAR antenna mounted on a platform moving with respect to the target is described. It includes a first-in first-out memory which has digital information clocked in at a rate related to the frequency of a transmitted radar signal and digital information clocked out with a fixed delay defining range between the SAR and the simulated target, and at a rate related to the frequency of the return signal. An RF input signal having a frequency similar to that utilized by a synthetic aperture array radar is mixed with a local oscillator signal to provide a first baseband signal to provide a first baseband signal having a frequency considerably lower than that of the RF input signal.

17J. Seismic Detection

AD-A107 383/2 PC **A03**/MF **A01**
Purdue Univ., Lafayette, IN. School of Electrical Engineering.
An Application of Syntactic Pattern Recognition to Seismic Discrimination,
Hsi Ho Liu, and King Sun Fu. Aug 81, 26p Rept no. TR-EE81-25
Contract N00014-79-C-0574, Grant NSF-PRF79-06296

Two syntactic methods for the recognition of seismic waveforms are presented in this paper. The seismic waveforms are represented by sentences (strings of primitives). Primitive extraction is based on a cluster analysis. Finite-state grammars are inferred from the training samples. The nearest-neighbor decision rule and error-correcting finite-state parsers are used for pattern classification. While both show equal recognition performance, the nearest-neighbor rule is much faster in computation speed. The classification of real earthquake/explosion data is presented as an application example. (Author)

PB82-137597 PC **A07**/MF **A01**
Prakla-Seismos G.m.b.H., Hanover (Germany, F.R.).
Direct Detection of Hydrocarbons Using Seismic Procedures,
Karl-Otto Millahn, Horst Koitka, Dieter Jurczyk, and Werner S. Jankowsky. Oct 79, 133p BMFT-FB-T-79-31
Trans. of mono. Direkte Erkennung von Kohlenwasserstoffen mit Seismischen Verfahren, n.p., May 78. See also German version, N81-14534. Prepared in cooperation with DEMINEX, German Petroleum Supply Co., Essen.

The aim of this project was to utilize such information about physical properties of the subsurface for a quantitive lithological interpretation as is contained in ampli-

tude, polarity, and frequency content of seismic signals. Methods for determination of amplitudes and spectra of seismic signals were combined to form a reliable and versatile interpretational system which allows an economical, semiautomatic extraction and a spatial presentation of various seismic parameters for lithological studies. An application of the system to an offshore survey area shows clear correlation between high amplitude anomalies and gas zones. Other indicators of hydrocarbons do not show such significant anomalies. Any quantitative interpretation of the results is impeded by complex layering of sandbeds which cannot be resolved by seismic techniques. The reliable lithological interpretation has to be tested by further experimental application to seismic data and has to be supported by petrophysical studies. A method was developed which allows a reliable determination of frequency-dependent attenuation if clear signals, undistorted by interference, are available and if comparatively high minimal attenuation is present. Problems which occur in the application to seismic data are discussed.

18.

NUCLEAR SCIENCE AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

AD-A107 466/5 PC **A04**/MF **A01**
California Univ., Berkeley. Electronics Research Lab.
Kink Instabilities in Long Ion Layers.
Memorandum rept.,
Douglas S. Harned. 16 Sep 81, 59p Rept no. UCB/ERL-M81/73
Contract N00014-77-C-0578

Kink instabilities in long ion layers immersed in a dense background plasma are studied. A numerical extension of the analytic model of Lovelace indicates that these instabilities will occur for values of the self-magnetic field index below those predicted previously. A quasineutral hybrid simulation code has been used to verify these lower thresholds. The simulations also show that the end of exponential growth occurs due to a nonlinear shift in the betatron frequency at large amplitude, producing an increase in layer thickness and a layer which has many non-axis-encircling ions. (Author)

DE81000241 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
X-Ray Backlighting Requirements for the Double-Shell Target.
J. T. Larsen. 26 Aug 80, 15p UCID-18773
Contract W-7405-ENG-48

We have analyzed one specific NOVA double-shell target design and have determined the x-ray energies required for probing the performance of the implosion. It is virtually impossible to study the compression of the fuel or the motion of the inner pusher. An x-ray energy of about 9 keV appears to be ideal for measuring the behavior of the outer TaCOH shell for the majority of its travel. However, it would be advantageous to have an x-ray source of about 25 keV to measure the contact between the two shells. Development of narrowband x-ray line sources are more desirable than broadband continuum sources since the intensity per keV is many times greater in the line. Intensities of the probes are determined by the self-emission levels of the target capsule. For the 9 keV line source, an intensity of upwards to 10 exp 15 keV/keV/sh/cm exp 2 /sr is required with a source area of about 0.01 cm exp 2 . (ERA citation 06:035750)

DE81029917 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Search for Promethium-Like Gold Lines and Other Transitions of Interest to Fusion Research.
B. M. Johnson, K. W. Jones, T. H. Kruse, L. J. Curtis, and D. G. Ellis. 1981, 20p BNL-29948, CONF-810868-2
Contract AC02-76CH00016
International conference on fast ion beam spectroscopy, Quebec, Canada, 17 Aug 1981.

EUV spectra in the range lambda = 13 to 40 rm were measured for foil-excited gold ions at 31 to 238 MeV. Data was recorded at the higher energies to extend and to complement previous measurements and at the lowest energy to see if the recently predicted 5s - 5p resonance lines in the Pm-like ion, Au XIX, could be seen in beam-foil excitation. The experimental results are presented, previous beam-foil measurements are reviewed, and the contributions and relations to fusion research are discussed. (ERA citation 06:035676)

DE81030035 PC **A02**/MF **A01**
Associated Universities, Inc., Washington, DC.
Review of Melting and Evaporation of Fusion-Reactor First Walls.
J. A. Fillo, and H. Makowitz. 1981, 8p BNL-29826, CONF-811101-10
Contract AC02-76CH00016
Winter annual meeting of the ASME Technology and Society Division, Washington, DC, USA, 15 Nov 1981.

The most severe thermal loading on the first wall will occur when the plasma becomes unstable resulting in a hard plasma disruption or at the end of a discharge when the plasma is dumped on the wall in a very short period of time. Hard plasma disruptions are of particular concern in future fusion reactors where the thermal energy of the plasma may reach values on the order of 300 MJ. Sufficiently high heating rates can occur to melt the first wall surface, and the temperature can increase resulting in vaporization. Thermal models are reviewed which treat these problems. (ERA citation 06:035720)

DE81030636 PC **A20**/MF **A01**
Oak Ridge National Lab., TN.
Ambipolar Potential Formation and Control in Bumpy Tori and Mirrors.
N. A. Uckan. Sep 81, 459p CONF-810511-
Contract W-7405-ENG-26
Workshop on ambipolar potential formation and control in bumpy tori and mirrors, Oak Ridge, TN, USA, 11 May 1981.

Separate abstracts were prepared for 19 of the included papers. Some of the included papers appeared earlier in ERA. A title listing only is given for three of the papers since only an abstract is given in the conference proceedings. (ERA citation 06:035677)

DE81032003 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
High-beta Studies with Beam-Heated, Non-Circular Plasmas in ISX-B.
E. A. Lazarus, S. C. Bates, and C. E. Bush. 1981, 5p CONF-810906-10
Contract W-7405-ENG-26
10. European conference on controlled fusion and plasma physics, Moscow, USSR, 14 Sep 1981.

In this paper we describe some preliminary results of high beta studies on ISX-B for mildly D shaped discharges. ISX-B is a modest size tokamak (R sub 0 = 93 cm, a = 27 cm) equipped with two tangentially-aligned neutral beam injectors giving a total power up to 3 MW. The poloidal coil system allows choice of plasma boundary shapes from circular to elongated (kappa less than or equal to 1.8), with D, elliptical, or inverse D cross sections. The non-circular work discussed here is for kappa approx. = 1.5. (ERA citation 06:035698)

DE81032008 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Status of ORR Spectral Tailoring and HFIR Irradiation Experiments.
1980, 9p CONF-8009179-1
Contract W-7405-ENG-26
ADIP program review meeting, Germantown, MD, USA, 30 Sep 1980.

Diagrams are given showing He vs dpa levels expected on the first wall of a fusion reactor and expectations from various fission reactors. Data on the ORR and HFIR spectral tailoring experiments are given. (ERA citation 06:035726)

DE82000503 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Monte Carlo Simulation of Molecular Flow in a Neutral-Beam Injector and Comparison with Experiment.
R. A. Lillie, T. A. Gabriel, S. W. Schwenterly, R. G. Alsmiller, Jr., and R. T. Santoro. Sep 81, 30p ORNL/TM-7911
Contract W-7405-ENG-26

Monte Carlo calculations have been performed to obtain estimates of the background gas pressure and molecular number density as a function of position in the PDX-prototype neutral beam injector which has undergone testing at the Oak Ridge National Laboratory. Estimates of these quantities together with the transient and steady-state energy deposition and molecular capture rates on the cryopanels of the cryocondensation pumps and the molecular escape rate from the injector were obtained utilizing a detailed geometric model of the neutral beam injector. The molecular flow calculations were performed using an existing Monte Carlo radiation transport code which was modified slightly to monitor the energy of the background gas molecules. The credibility of these calculations is demonstrated by the excellent agreement between the calculated and experimentally measured background gas pressure in front of the beamline calorimeter located in the downstream drift region of the injector. The usefulness of the calculational method as a design tool is illustrated by a comparison of the integrated beamline molecular density over the drift region of the injector for three modes of cryopump operation. (ERA citation 06:035744)

LA-UR-80-2406 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Magnetic Islands and Stochastic Field Lines in the RFP.
R. L. Spencer. 1980, 7p CONF-800484-5
Contract W-7405-ENG-36
Reversed field pinch theory workshop, Los Alamos, NM, USA, 28 Apr 1980.

The effect of magnetic perturbations on RFP equilibria is considered. Using a Hamiltonian representation for the magnetic field lines, the formation of magnetic islands is discussed. The transition from magnetic island to stochastic field lines is also discussed. As an example, the effect of the magnetic perturbations caused by pumping ports in ZT-40 is computed using a crude model for the pumping port fields. (ERA citation 05:034414)

LA-UR-80-2499 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Inertial Confinement Fusion Reactor Systems.
T. G. Frank, I. O. Bohachevsky, and J. H. Pendergrass. 1980, 18p CONF-800950-1
Contract W-7405-ENG-36
11. symposium on fusion technology, Oxford, UK, 15 Sep 1980.

A variety of reactor cavity concepts, drivers, and energy conversion mechanisms are being considered to realize commercial applications of ICF. Presented in this paper are: (1) a review of reactor concepts with estimates of practically achievable pulse repetition rates; (2) a survey of drivers with estimates of the requirements on reactor conditions imposed by beam propagation characteristics; and (3) an assessment of compatible driver-reactor combinations. (ERA citation 05:034423)

LA-UR-80-2500 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Stable Heating and Burn Simulations of a Reversed-Field Pinch Reactor.
R. W. Moses, Jr., R. A. Nebel, and G. H. Miley. 1980, 7p CONF-800948-1
Contract W-7405-ENG-36
Joint Grenoble-Varenna international symposium on heating in toroidal plasmas, Grenoble, France, Sep 1980.

The reversed-field pinch provides three significant advantages as a fusion reactor: it can be ohmically heated, it operates at high beta , and it is not restricted to a small aspect ratio. Experimentally, the best understood startup scenarios are self reversal, aided reversal and fast-field programming. On the basis of results from a one-dimensional transport and stability code, an ideal MHD stable startup and burn procedure is described in this paper. Pitch programming and a gas

feed at the wall are used. This adiabatic startup is characterized by a high pitch near the minor axis and hollow current and pressure profiles. Ideally, it would be possible to have a reactor startup and burn without highly turbulent processes to deposit excessive amounts of energy on the wall. Potential problems of resistive instabilities and plasma-wall interactions are discussed. (ERA citation 05:034415)

LA-8286-MS PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
First Wall Magnetic Protection in an Inertially Confined Thermonuclear Reactor.
J. J. Devaney. May 80, 27p
Contract W-7405-ENG-36

On the basis of three different theories, it is shown for a typical set of reactor parameters that inertially confined microexplosions are either (1) stable during early expansion; or (2) only weakly unstable during expansion with flute amplitude growth of but 0.005%; or (3) only weakly unstable during expansion with negligible flute amplitude growth. Simple formulas are given for skin depths in the plasma (approx. 0.3 cm for 500 exp 0 C graphite). Plasma behavior is found to be collective and ambipolar. Formulas are given for calculating the strength of the required protecting initial magnetic field. For a microexplosion putting 16-MJ kinetic energy into 0.25 g of lead debris, we find 3.2 kG to be adequate protection in a reactor chamber of 200-cm radius with a graphite (or other conducting) wall. (ERA citation 05:030013)

LA-8375-PR PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Tokamak Poloidal Field Systems. Progress Report, January 1-December 31, 1979.
J. D. Rogers. May 80, 15p
Contract W-7405-ENG-36

Work is reported on the development of superconducting tokamak poloidal field systems (TPFS). Progress is discussed on the design of a 20 MJ, 50 kA, 7.5 T superconducting pulsed energy storage coil operated in a 1 to 2 s bipolar mode from +7.5 T to -7.5 T in 1982. Conductor development for the coil is presented. A facility that uses a traction motor energy transfer system to test coils in the 20 to 100 MJ energy range is discussed. Current interrupter development and testing for protection and energy transfer circuits are also presented. The 400 kJ METS coil test preparation is under way. (ERA citation 05:028201)

NRL-MR-4180 PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
Ion Beam Propagation in a Filamented Channel.
P. F. Ottinger, S. A. Goldstein, and D. Mosher. 3 Mar 80, 13p
Contract AI01-77DP40042

The production of intense focused ion beams has led to the consideration of using z-discharge plasma channels to transport them several meters to inertial fusion targets. Analysis has shown that current bunching will occur in the channel during transport. In this report ion beam propagation in a filamented channel is investigated in order to determine the effects on radial beam containment in channels and on the radial beam density profile. (ERA citation 05:034424)

NRL-MR-4213 PC **A04**/MF **A01**
Naval Research Lab., Washington, DC.
Tokamak Heating and Current Maintenance with Intense Pulsed Ion Beams.
W. M. Manheimer, and N. K. Winsor. 21 Aug 80, 63p
Contract AI01-76ET53020

This paper examines tokamak heating with intense pulsed ion beams. It finds that plasma can be heated to ignition or to Q approx. 1 and depending on the injection scheme, the current can be maintained or even generated by the beam. (ERA citation 05:033116)

N82-11924/9 PC **A07**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Theory of Drift Instabilities and the Associated Anomalous Transport.
K. Nishikawa, M. Wakatani, T. Tuda, T. Tange, and T. Hatori. Jul 81, 134p IPPJ-REV-1

Drift waves, which are inherent in inhomogeneous magnetized plasmas, are considered the most promising candidate for explaining anomalous particle and electron heat transport in toroidal plasmas. The linear and nonlinear theories of drift instability are examined. Anomalous transport in Tokamaks is examined from a phenomenological viewpoint as well as in to relation to kinetic theory. Saturation levels and modes are discussed as well as the effect of magnetic shear and of the torus.

N82-11929/8 PC **A03**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Boosting Up of Neutral Beam Heating Power by Slowly Rising Toroidal Field.
R. Y. Lin, K. Hirano, M. Okamoto, K. Shimizu, and T. Amano. Aug 81, 33p IPPJ-534

A system of 1-D transport codes combined with Fokker-Planck codes was used to simulate plasmas undergoing compression with beam injection for the 'R-Project Tokamak'. The impurity radiation is not included. The numerical model contains the neoclassical transport including the Ware pinch, empirical anomalous particle and electron heat transports based on the Alcator scaling, and neutral particle transport. The combination results are very encouraging. They show that by sinusoidally increasing the toroidal magnetic field and the plasma current simultaneously, it is possible to significantly increase the temperature with a very slow compression. The final ion temperature is very weakly dependent on the compression time from 0.5 sec to 1 sec for the 'R-Project Tokamak'. If the 'R-Project Tokamak' plasma is compressed by sinusoidally increasing the magnetic field and plasma current simultaneously, then the beam power which is necessary to obtain an average ion temperature of keV without compression 15 MW can be decreased to 8.5 MW.

ORNL/TM-7049 PC **A09**/MF **A01**
Westinghouse Electric Corp., Pittsburgh, PA. Fusion Power Systems Dept.
Tokamak Blanket Design Study, Final Report.
Aug 80, 192p
Contract W-7405-ENG-26

A cylindrical module concept was developed, analyzed, and incorporated in a tokamak blanket system that includes piping systems, vacuum boundary sealing, and support structures. The design is based on the use of state-of-the-art structural materials (20% cold-worked type 316 stainless steel), lithium as the breeding material, and pressurized helium as the coolant. The module design consists of nested concentric cylinders (with an outer diameter of 10 cm) and features direct wall cooling by helium flowing between the outer (first-wall) cylinder and the inner (lithium-containing) cylinder. Each cylinder can withstand full coolant pressure, thus enhancing reliability. Results show that stainless steel is a viable material for a first wall subjected to a neutron wall loading of 4 MW/m exp 2 and a particle heat flux of 1 MW/m exp 2 . Lifetime analysis shows that the first-wall design meets the goal of operating at 20-min cycles with 95% duty for 100,000 cycles. To reduce system complexity, a larger 20-cm-diam module also was analyzed for incorporation in the blanket assembly. Reliability assessment indicates that it may be possible to double the module in size from 10 to 20 cm in diameter. With a modest increase in coolant pumping power, a blanket assembly comprising 20-cm-diam modules can still achieve 100,000 operating cycles - equivalent to a 3.6-year design lifetime - with only one or two helium coolant leaks into the plasma. (ERA citation 05:034413)

ORNL/TM-7360 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Calculation of Neutron and gamma Ray Energy Spectra for Fusion Reactor Shield Design: Comparison with Experiment.
R. T. Santoro, R. G. Alsmiller, Jr., J. M. Barnes, and G. T. Chapman. Aug 80, 42p
Contract W-7405-ENG-26

Integral experiments that measure the transport of approx. 14 MeV D-T neutrons through laminated slabs of proposed fusion reactor shield materials have been carried out. Measured and calculated neutron and gamma ray energy spectra are compared as a function of the thickness and composition of stainless steel type 304, borated polyethylene, and Hevimet (a tungsten alloy), and as a function of detector position behind these materials. The measured data were obtained using a NE-213 liquid scintillator using pulse-shape discrimination methods to resolve neutron and gamma ray pulse height data and spectral unfolding methods to convert these data to energy spectra. The calculated data were obtained using two-dimensional discrete ordinates radiation transport methods in a complex calculational network that takes into account the energy-angle dependence of the D-T neutrons and the nonphysical anomalies of the S/sub n/ method. (ERA citation 05:033133)

PATENT-4 260 455
Not available NTIS
Department of Energy, Washington, DC.
Mirror Plasma Apparatus.
Patent,
R. W. Moir. Filed 14 Mar 78, patented 7 Apr 81, 8p
PAT-APPL-886 370
Supersedes PAT-APPL-886 370-78.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

A mirror plasma apparatus which utilizes shielding by arc discharge to form a blanket plasma and lithium walls to reduce neutron damage to the wall of the apparatus. An embodiment involves a rotating liquid lithium blanket for a tandem mirror plasma apparatus wherein the first wall of the central mirror cell is made of liquid lithium which is spun with angular velocity great enough to keep the liquid lithium against the first material wall, a blanket plasma preventing the lithium vapor from contaminating the plasma. (ERA citation 06:038843)

18B. Isotopes

LA-UR-80-2414 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Status of exp 241 Am Recovery and Purification at Los Alamos Scientific Laboratory.
H. D. Ramsey, D. G. Clifton, S. W. Hayter, R. A. Penneman, and E. L. Christensen. 1980, 21p CONF-800814-14
Contract W-7405-ENG-36
180. American Chemical Society meeting/2. chemical congress of the North American Continent, Las Vegas, NV, USA, 24 Aug 1980, Portions of this document are illegible.

Americium recovery was initiated at Los Alamos Scientific Laboratory (LASL) in the late 1940's. The early procedures separated gram quantities of americium from large amounts of impurities including plutonium and the rare earths. Ion exchange procedures were developed for further purification. Until recently, no routine processing of americium has been done at LASL for several years. The increasing demand for americium in oil-well logging instruments and other uses led LASL to develop and install a process to recover larger quantities of americium. The LASL process was developed around the chemistry of americium that had been elucidated both at LASL and at other facilities. Presently, the americium feed is obtained as a by-product from a plutonium purification process at the new plutonium facility at LASL. This feed filtrate from a peroxide precipitation process is precipitated as a slurry of hydroxides, filtered, dissolved in nitric acid, and passed through an anion exchange column to remove any residual plutonium. The americium, contained in the effluent, is precipitated as the oxalate and calcined to the oxide. Americium is also available in other highly salted acidic process streams. These should lend themselves to solvent extraction. Developmental work has been promising, and a dibutyl butyl phosphate-kerosene extraction process is being brought on-line. (ERA citation 05:033928)

MLM-2727 PC **A04**/MF **A01**
Mound Facility, Miamisburg, OH.
Mound Facility Activities in Chemical and Physical Research: July-December 1979.
18 Jun 80, 56p
Contract AC04-77DP00053

Research is reported in the following fields: isotope separation (Ar, C, He, Kr, Ne, O, Xe), low-temperature research (H intermolecular potential functions, gas analysis in trennschaukel), separation chemistry (exp 229 Th, exp 231 Pa, exp 230 Th, exp 234 U), separation research (liquid thermal diffusion, Ca isotope separation, molecular beam scattering, mutual diffusion of noble gas mixtures, lithium chemical exchange with cryptands), and calculations in plutonium chemistry

(algorithms, valence in natural water). (ERA citation 05:033939)

18C. Nuclear Explosions

AD-A107 317/0 PC **A14**/MF **A01**
JAYCOR, Alexandria, VA.
PLUMBBOB Series, 1957.
Technical rept. 24 Apr-7 Oct 57,
P. S. Harris, C. Lowery, A. Nelson, S. Obermiller, and W. J. Ozeroff. 15 Sep 81, 311p JAYCOR-2087-79-02, DNA-6005F
Contract DNA001-78-C-0311

This report describes the activities of DOD participants in the atmospheric nuclear test series, Operation PLUMBBOB. The various levels at which DOD personnel participated with the Nevada Test Organization are identified. DOD participants in Desert Rock Exercise Projects are described. The AEC and DOD criteria and procedures for Rad-safe are included. Those projects related to DOD mission activities are described as to purpose, agency, operations, and Rad-safe aspects. (Author)

AD-A107 359/2 PC **A03**/MF **A01**
Systems, Science and Software, La Jolla, CA.
The Underwater Acoustic Signature of a Nuclear Explosion at the Ocean Surface.
Interim technical rept.,
T. C. Bache, T. G. Barker, M. G. Brown, K. D. Pyatt, and H. J. Swanger. Jul 80, 32p SSS-R-80-4586, VSC-TR-81-24
Contract F08606-79-C-0008, ARPA Order-2551

The gross spectral character and duration of the acoustic wave signature of a nuclear explosion near the ocean surface is estimated by constructing theoretical pressure-time histories, using models for the explosion and wave propagation. The explosion is assumed to have a yield of 1 KT and the nominal range is 6600 km. The frequencies of interest are rather low, 50 Hz and less, so absorption is small and the estimates of spectral character and duration essentially decouple. The spectrum depends almost entirely on the source characteristics and the duration is controlled by characteristics of the travel path. The airblast-induced pressure loading on the ocean surface dominates the source, with the acoustic waves from direct coupling into the water being relatively small. At large distances, the spectrum for 1 KT peaks near 20 Hz and is band-limited between 5 and 50 Hz. For different energy yields these frequencies scale with the cube-root of the yield. Different assumptions about the (laterally homogeneous) oceanic sound profile lead to differing estimates for the signal duration. Values of 20 to 60 seconds seem most reasonable. (Author)

18D. Nuclear Instrumentation

LA-UR-80-1358 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Data Acquisition and Control for gamma Scanning.
B. K. Barnes, A. S. Murray, and J. N. Quintana. 1980, 20p CONF-800693-1
Contract W-7405-ENG-36
28. conference on remote systems technology, Las Vegas, NV, USA, 8 Jun 1980.

A new computer-based data acquisition and control unit has been installed in the Los Alamos Scientific Laboratory (LASL) system for scanning irradiated reactor fuel pins. The scanning mechanism is controlled by a commercial multichannel analyzer via a CAMAC link with an intelligent crate controller. The scanning and control unit consists of three linked LSI-11 computers. The multitasking capability of the commercial operation system allows control decisions to be based upon currently acquiring data. (ERA citation 05:032729)

LA-UR-80-1943 PC **A02**/MF **A01**
Texas Univ. at Austin.
Polarimeter for Protons Between 300 and 800 MeV.
R. D. Ransome, C. L. Hollas, S. J. Greene, B. E. Bonner, and M. W. McNaughton. 1980, 3p CONF-800824-18
Contract W-7405-ENG-36
International symposium on polarization phenomena in nuclear physics, Santa Fe, NM, USA, 11 Aug 1980.

A polarimeter for protons between 300 and 800 MeV has been constructed. It uses a carbon block analyzer of variable thickness and 6 drift chambers for particle tracking. (ERA citation 05:034095)

LBL-11097 PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Operating Instructions for LBL Radon Measurement Facilities.
J. G. Ingersoll. Jun 80, 32p EEB-Vent-80-13
Contract W-7405-ENG-48

This manual is intended for users of the radon-measuring facilities of the Radon Project of the Building Ventilation and Indoor Air Quality Program at Lawrence Berkeley Laboratory. The manual comprises three parts. Part 1 sets out the steps involved in collecting, transferring, and counting radon. Part 2 describes the calibration of the transfer system and of the Lucas cells in the counting system. Part 3 outlines the maintenance procedures for the facility. (ERA citation 05:034137)

LBL-9128 PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Beta-Gauge Methods Applied to Aerosol Samples.
J. M. Jaklevic, R. C. Gatti, F. S. Goulding, and B. W. Loo. Nov 79, 34p
Contract W-7405-ENG-48

An instrument for the routine measurement of aerosol mass using the beta-particle attenuation method is described. Factors affecting the precision and accuracy of the measurement are discussed in detail. Results of intercomparison studies between the beta gauge method and conventional gravimetric are presented. The design of the present instrument is particularly well suited for the automatic analysis of membrane filter obtained from modern dichotomous samplers. (ERA citation 05:016400)

PAT-APPL-6-222 936 PC **A02**/MF **A01**
Department of Health and Human Services, Washington, DC.
Four Input Coincidence Detector.
Patent Application,
Walter S. Friauf. Filed 6 Jan 81, 17p PB82-137530
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

This invention relates generally to the measurement of nuclear radiation using scintillation counters, and, more particularly, to positron imaging systems in which two gamma rays resulting from the annihilation of a positron can be identified by the fact that they are detected almost simultaneously.

PATENT-4 259 575
Not available NTIS
Department of Energy, Washington, DC.
Directional gamma Detector.
Patent,
S. A. Cox, and F. E. Levert. Filed 4 Apr 80, patented 31 Mar 81, 6p PAT-APPL-6-137 095
Supersedes PAT-APPL-6-137 095.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

An improved directional gamma radiation detector has a collector sandwiched between two layers of insulation of varying thicknesses. The collector and insulation layers are contained within an evacuated casing, or emitter, which releases electrons upon exposure to gamma radiation. Delayed electrons and electrons entering the collector at oblique angles are attenuated as they pass through the insulation layers on route to the collector. (ERA citation 06:037345)

PB82-137449 Not available NTIS
National Bureau of Standards, Washington, DC.
Calculated Response of Intrinsic Germanium Detectors to Narrow Beams of Photons with Energies Up to Approximately 300 keV.
Final rept.,
Stephen M. Seltzer. 1981, 19p
Pub. in Nuclear Instruments and Methods 188, p133-151 1981.

The response of small intrinsic Ge detectors has been calculated for photons incident with energies up to about 300 keV. The results include the effects of scattering and escape from the detector of the photons and of Ge characteristic X-rays produced in photoelectric absorption. Included also are the effects of the backscattering of photons from material behind the detector. The results, based on Monte Carol calculations for various photon energies and detector sizes, have been generalized on the basis of a single-scatter model and are given as a set of formulae that can be evaluated for any photon energy and detector size in the range of interest. The formulae are used to tabulate photopeak efficiencies for a large number of commercially available detectors, and to generate response functions for unfolding measured pulse-height distributions obtained for continuous incident spectra.

PB82-140617
(Order as PB82-140575, PC **A05**/MF **A01**)
National Bureau of Standards, Washington, DC. National Measurement Lab.
The Graphite Calorimeter as a Standard of Absorbed Dose for Cobalt-60 Gamma Radiation,
John S. Pruitt, Steve R. Domen, and Robert Loevinger. 6 May 81, 8p
Included in Jnl. of Research of the National Bureau of Standards, v86 n5 p495-502, Sep-Oct 81.

Absorbed dose to water in a cobalt-60 gamma-ray beam has been determined using a thick-walled graphite ionization chamber. The chamber was calibrated in a graphite phantom against a graphite calorimeter, and the graphite calibration factor was converted to a water calibration factor using published energy absorption coefficient ratios and a measured replacement factor. Comparisons between the graphite and water measurements were made at pairs of points that were scaled in position according to the ratio of electron densities, so that the photon spectra were the same for the two points in a given pair. Measurements performed in graphite over a wide range of phantom depths, field sizes, and source distances, showed that the calibration factor varies slowly with the phantom depth and field size, and probably has a negligible dependence on source distance. By comparison with the thick-walled chamber in a cobalt-60 gamma-ray beam, a secondary ionization chamber can be calibrated in terms of absorbed dose to water with an estimated uncertainty of about + or - 1 percent.

PB82-859869 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Spark Chambers. 1970-1981 (Citations from the NTIS Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 163p
Supersedes PB81-857914.

Design and applications of spark chambers in high energy physics, nuclear scattering, space radiation, and health physics are included in this bibliography. Programs and techniques to correlate the information from spark chambers are also discussed. (This updated bibliography contains 144 citations, 29 of which are new entries to the previous edition.)

PB82-859885 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Spark Chambers. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 294p
Supersedes PB81-857922. Prepared in cooperation with the Department of Energy, Washington, DC.

Design and applications of spark chambers in particle physics, nuclear physics, and cosmic ray research are discussed in the cited reports. Automatic processing of spark chamber data, spark chamber telescopes, and patented spark chamber design are also included. (This updated bibliography contains 300 citations, 100 of which are new entries to the previous edition.)

18E. Nuclear Power Plants

AD-A106 915/2 PC **A06**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Greater Commitment Needed to Solve Continuing Problems at Three Mile Island.
Report to the Congress.
26 Aug 81, 121p Rept no. GAO/EMD-81-106

The Nation's first major accident at a commercial nuclear-powered electricity generating station occurred at Three Mile Island over 2 years ago, yet the resolution of the resultant problems is still subject to regulatory and financial uncertainty. Consequently, little progress has been made to clean up the damaged facility or alleviate the extreme financial stress placed upon its owners. The remedies required to resolve the continuing problems at Three Mile Island will require unprecedented coordination and commitment by Federal and State regulatory bodies, the electric utility industry, the financial community, and the owners of the damaged facility. To safeguard against similar problems in the future, the Nuclear Regulatory Commission should develop accident recovery guidelines and ensure that increased property insurance coverage is available for nuclear facilities. (Author)

AD-A106 917/8 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Congress Should Increase Financial Protection to the Public from Accidents at DOE Nuclear Operations.
14 Sep 81, 27p Rept no. GAO/EMD-81-111

Since the Federal Government is still committed to fostering private industry involvement in nuclear energy, and since alternative methods for insuring the public against the potential hazards of a catastrophic nuclear accident do not provide as much financial protection as does the Price-Anderson Act, we believe that the financial protection provided DOE-contractor operations is still needed. Differences in the treatment of DOE-contractor operations under the Price-Anderson Act, however, serve to provide less financial protection to the public against losses from nuclear accidents from DOE-contractor operations than from licensed commercial activities. Because DOE contractors are covered by only one layer of financial protection, current coverage is $60 million lower than for commercial licensees. Thus, the public may not be equally compensated if damages exceed $500 million. Further, as more commercial reactors are licensed to operate and the limit on liability rises on the commercial side, this gap in coverage will widen. In our opinion, public financial protection should be consistently applied, regardless of who is performing the nuclear activity.

DE81025021 PC **A05**/MF **A01**
Florida Univ., Gainesville. Coll. of Engineering.
Nuclear Reactor Maintenance Technology Assessment. Final Summary Report, September 16, 1978-September 15, 1979.
D. Tesar, M. J. Ohanian, and E. T. Dugan. 18 Jul 80, 95p DOE/OR/06102-T1
Contract AS05-78OR06102

Nuclear power plants have exhibited a downtime of one day in four during the past decade. For mature LWR plants, 40% of this downtime is due to forced (unexpected) outages. These outages increase the loss of revenues and increase occupational radiation exposure. In 1979, the cost of maintenance of 70 operating plants was $1 billion per year. A fully remote maintenance technology would save 70% of this cost. PWR steam generator maintenance under fully remote system technology could save $270 million a year. BWR valve maintenance with fully remote technology could save $54,000,000 a year. Benefits for 150 plants by the early 1990's would be substantially higher; the total yearly savings would amount to $1.8 billion. The PWR steam generator would save $550 million while the BWR valve problem would save $140 million. For nuclear power plant maintenance, the vendors initially took steps to redesign and improve the reliability of the reactor system. The second step was to develop special maintenance tooling. The development of a generalized robotic manipulator having greater precision, dexterity, reliability, obstacle avoidance capability and load capacity is now feasible using microelectronics and computers. In order to drive this more general slave, the master controller must also be generalized to create a man-machine interface as transparent as possible; software modules must be developed which filter jitter, change scales, automaticaly control vision systems, and adapt force feedback signals in order to enhance the speed and precision of operation of the total system. A full complement of component technologies such as sensors, actuators, end-effectors, and remote TV vision systems must also be developed. Several other energy systems represent operations where such remote systems technology may be valuable. (ERA citation 81:025499)

GA-A-15837 PC **A02**/MF **A01**
General Atomic Co., San Diego, CA.
HTGR-GT Closed-Cycle Gas Turbine: A Plant Concept with Inherent Cogeneration (Power Plus Heat Production) Capability.
C. F. McDonald. Apr 80, 10p CONF-800806-14
Contract AT03-76SF70046
15. intersociety energy conversion engineering conference, Seattle, WA, USA, 18 Aug 1980.

The high-grade sensible heat rejection characteristic of the high-temperature gas-cooled reactor-gas turbine (HTGR-GT) plant is ideally suited to cogeneration. Cogeneration in this nuclear closed-cycle plant could include (1) bottoming Rankine cycle, (2) hot water or process steam production, (3) desalination, and (4) urban and industrial district heating. This paper discusses the HTGR-GT plant thermodynamic cycles, design features, and potential applications for the cogeneration operation modes. This paper concludes that the HTGR-GT plant, which can potentially approach a 50% overall efficiency in a combined cycle mode, can significantly aid national energy goals, particularly resource conservation. (ERA citation 05:032262)

PB82-138363 PC **E05**/MF **E05**
Commission of the European Communities, Luxembourg.
Analysis of Complete Logical Structures in System Reliability Assessment,
A. Amendola, C. A. Clarotti, S. Contini, and F. Spizzichino. c1980, 89p EUR-6886-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The use of fault tree techniques has been widely explored to study the risks and reliability of nuclear reactors. This analysis identifies situations in which the conventional AND-OR system is thought to be insufficient and the inclusion of a NOT function is necessary. Various examples are examined to show that exact analysis requires the determination of the minimal, irredundant base of the Boolean function. However, in many cases the method can be simplified by opting for either of two approaches which permit the reduction of complete fault trees to AND-OR structures. This permits bounds to be set to the probability of specific top events occurring within a given time, when the hypothesis of structure function monotonicity is removed.

PB82-138389 PC **E03**/MF **E03**
Commission of the European Communities, Luxembourg.
RSM Development for Nuclear Safety Analysis. A Test Problem,
A. Amendola, F. Argentesi, M. Astolfi, S. Canali, and B. Lisanti. c1981, 38p EUR-7031-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Safety analysis of nuclear plants demands the running of complex simulation computer programs to provide probability distribution functions of particular outcomes. Response surface methodology (RSM) is a technique for simplifying the analysis by giving the information in the form of a simple function. This approach has been applied to safety analysis methods. An analytical function (14-variable polynomial) was used in place of the simulation program and its performance was analyzed by RSM. The results were satisfactory for a centrally distributed probability function, but less effective for uniform or lateral distributions. It is necessary to determine whether different designs or whether an adequate distribution can be found.

18F. Radiation Shielding and Protection

DE81024032 PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Evaluation of Proposed Methods of Radioactive Material Container Tie-down Design for Truck Transport.
G. H. Lamoreaux. 1981, 4p SAND-81-1417C, TTC-0225, CONF--811103--2
Contract AC04-76DP00789
ANS winter meeting, San Francisco, CA, USA, 29 Nov 1981.

The following conclusions were drawn from this study: casks over 9100 kg in mass and their restraining systems can be considered rigid in the vertical direction for the lower modes of vibration. Vehicle bed accelerations for truck transportation system vary significantly from system to system. Vehicle bed accelerations of additional systems need to be measured before a general design guide can be provided. Simple, cost efficient tests are being conducted that will provide the data necessary for adequate guidance to the design of tie-downs for large shipping containers. (ERA citation 06:035324)

DE81030298 PC **A02**/MF **A01**
Atomics International Div., Golden, CO. Rocky Flats Plant.
Magnesium Hydroxide Neutron-Shielding Material and Method of Producing Such Material.
S. Aoki, H. Asami, and I. Takeshige. 2 Mar 78, 10p RFP-Trans-297
Contract AC04-76DP03533
C Japanese Patent 1978-53-22998.

A method for producing neutron-shielding material consisting of formed magnesium hydroxide having a very high density of hydrogen atoms (hydrogen concentration) is described. Such material is very effective for moderation and absorption of fast neutrons. (ERA citation 06:035660)

DE82000820 PC **A04**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Development of Analytical Tools for the Punch Investigation of the Transuranic Package Transporter (TRUPACT).
S. H. Sutherland, and T. A. Duffey. May 81, 58p SAND-80-1879
Contract AC04-76DP00789

Methods of simplified analysis are presented for the evaluation of the punch resistance of the TRUPACT sidewalls. The first method consists of an elastic analysis of a foam-backed triangular plate. This analysis, which accurately models the geometry of the TRUPACT sidewall (though not the material behavior) is then used to evaluate the influence of the particular location on the sidewall where the punching is taking place. The second method consists of a plastic membrane analysis of a circular plate in which both the plate material and foam backing exhibit plastic behavior. In this analysis, the material behavior of the TRUPACT is accurately modeled, whereas the geometry is not. This analysis is used to estimate the minimum thickness of the foam-backed outer skin required to prevent its perforation. (ERA citation 06:035321)

LA-UR-80-1933 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Polarized Targets and Polarized Low Energy Neutrons at WNR.
P. P. J. Delheij, G. L. Morgan, and P. W. Lisowski. 1980, 3p CONF-800824-17
Contract W-7405-ENG-36
International symposium on polarization phenomena in nuclear physics, Santa Fe, NM, USA, 11 Aug 1980.

A description of the experimental setup used at the WNR facility to study the interaction of polarized neutrons with polarized samples is given. Planned measurements of the magnetic moments of compound nuclear resonances are discussed. (ERA citation 05:034366)

NUREG/CR-2146-V1 PC **A03**/MF **A01**
Hanford Engineering Development Lab., Richland, WA.

Dynamic Analysis to Establish Normal Shock and Vibration of Radioactive Material Shipping Packages.
Quarterly progress rept. 1 Jan-31 Mar 81,
S. R. Fields. Nov 81, 36p HEDL-TME-81-15
See also report for Oct-Dec 80, NUREG/CR-1685-V4.

The CARDS (Cask Rail Car Dynamic Simulator) model was expanded to simulate the cask rail car system used in Tests 10 and 11 of the series of rail car coupling tests conducted at the Savannah River Laboratories (SRL) in July and August of 1978. An assessment of how well CARDS simulates the behavior of this cask rail car system was made by comparing calculated and experimental values of four response variables. The processing and interpretation of the data from Tests 10, 11, 13, 16, 17 and 18 of the SRL series has been completed.

NUREG/CR-2195 PC **A03**/MF **A01**
South Carolina State Dept. of Health and Environmental Control, Columbia. Bureau of Radiological Health.
Transportation of Radioactive Material in South Carolina.
Surveillance study Oct 79-Sep 80.
Nov 81, 29p
See also PB-286 866. Sponsored in part by Department of Transportation, Washington, DC.

The report describes the third year's study by the State of South Carolina of the transportation of radioactive materials in South Carolina, during the period, October 1, 1979 to September 30, 1980. The study was performed under contract to the Nuclear Regulatory Commission and the Department of Transportation. Low-level radioactive waste represents the largest portion of radioactive material transported in the State due to the commercial low-level radioactive waste facility at Barnwell, SC. The study has shown that violations of applicable Federal and State regulations persist; however, the health and safety of the public and of waste handlers has not been compromised as a result of these shipments. The study recommends that these shipments continue to be monitored and that strict enforcement actions be taken against violators. Also, more training is recommended for persons associated with handling and transporting radioactive materials.

18G. Radioactive Wastes and Fission Products

CONF-791103-70 PC **A03**/MF **A01**
Exxon Nuclear Idaho Co., Inc., Idaho Falls.
Mockup Testing of Remote Systems for Zirconium Fuel Dissolution Process at the Idaho Chemical Processing Plant.
D. M. Paige. 1979, 28p
Contract EY-76-C-07-1570
American Nuclear Society meeting, San Francisco, CA, USA, 12 Nov 1979.

A facility is being constructed at the Idaho National Engineering Laboratory for storage and dissolution of spent zirconium reactor fuels. The dissolution is carried out in chemical type equipment contained in a large shielded cell. The design provides for remote operations and maintenance as required. Equipment predicted to fail within 5 years is designed for remote maintenance. Each system was fabricated for mockup testing using readily available materials. The mockups were tested, redesigned, and retested until satisfactory remote designs were achieved. Records were made of all the work. All design changes were then incorporated into the ongoing detailed design for the actual equipment. Several of these systems are discussed and they include valve replacement, pump replacement, waste solids handling, mechanism operations and others. The mockup program has saved time and money by eliminating many future problems. In addition, the mockup program will continue through construction, cold startup, and hot operations. (ERA citation 05:014921)

DE81023692 PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Experimental Source Term Data Base for Assessing the Safety of Spent Fuel Transportation.
R. P. Sandoval, M. G. Vigil, and G. J. Newton. 1981, 5p SAND-81-1188C, CONF-811103-5
Contract AC04-76DP00789
ANS winter meeting, San Francisco, CA, USA, 29 Nov 1981.

This paper deals with a program currently underway at Sandia National Laboratories (SNL) to characterize source term aerosols produced from exposing spent fuel transport systems to extraordinary environments and to produce improved estimates of environmental and health consequences. The extreme environments of interest have been divided into two categories: those related to explosive attack and those related to extra-severe accidents. Efforts in this program to date have concentrated on the development of an experimental data base characterizing the release of radioactive material (i.e. source terms) resulting from explosive attacks on spent fuel casks. This experimental data base is the primary input to an analysis of the human health and economic consequences. (ERA citation 06:034364)

DE81025833 PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Sensitivity Analysis of Transportation Parameters on Spent-Fuel-Cask Projections.
S. C. McGuire, D. S. Joy, and J. W. Cashwell. 1981, 12p SAND-81-1523C, CONF-811103-9, TTC---0229
Contract AC04-76DP00789
ANS winter meeting, San Francisco, CA, USA, 29 Nov 1981.

The parameters varied were average carrier speed, turnaround time at either end of shipping route, and cask availability. For a storage facility in the northwest US, the cask fleet requirements are most sensitive to the average transportation speed. The greatest effect on cask requirements for the midwestern facility results from variations in cask turnaround times. (ERA citation 06:034367)

DE81030403 PC **A02**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Plant.
High-Current Resistance Welding of Nuclear-Waste Containers.
B. J. Eberhard, and J. W. Kelker, Jr. Jul 81, 19p
DPSPU-80-30-9, CONF-810404-2
Contract AC09-76SR00001
American Welding Society conference, Cleveland, OH, USA, 6 Apr 1981.

Various methods are being investigated for permanent disposal of high level nuclear wastes. In one process the waste is incorporated in molten glass and poured into type 304-L stainless steel canisters which provide the first layer of a multilayer containment system. Upset welding was selected as the process best suited for sealing the fill hole in the canister since this process is amenable to use in a remotely operated facility. Welding paramters are readily controlled and dynamically recorded during the course of the weld. Weld quality can be controlled and assessed through control of the process. The process was shown to be suitable for producing welds up to 5 in. (127 mm) in diameter and having 0.38-in. (9.5 mm) throat thickness. Weld current of 230,000 A AC, electrode force of 75,000 lb (333,600 N), and weld time of 2.0 seconds were required for a 5-in. (127 mm) diameter weld. The welds have a wrought structure and the tensile strength of the weld metal equals or exceeds that of the annealed base material. The size weld that can be produced appears limited only by the ability to provide sufficient welding current. A welder designed to deliver 400,000 A DC is being installed in a nonradioactive nuclear waste pilot facility. (ERA citation 06:034377)

DE81030490 PC **A02**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Leaching of Nuclear-Waste Forms.
J. A. Stone. 1981, 17p DP-MS-81-44, CONF-810956-1
Contract AC09-76SR00001
Federation of Analytical Chemistry and Spectroscopy Societies meeting, Philadelphia, PA, USA, 20 Sep 1981.

This paper presents an overview of leach test methods and of factors that affect leaching of nuclear waste solids. Some of the analytical requirements are discussed. (ERA citation 06:035210)

DE81030840 PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Systems Studies of Waste Transportation.
G. C. Allen, J. W. Cashwell, C. G. Shirley, and M. G. Vigil. 1981, 11p SAND-81-1966C, CONF-811119-2
Contract AC04-DP00789
NWTS program information meeting, Columbus, OH, USA, 17 Nov 1981.

The National Waste Terminal Storage transportation technology task being coordinated is a combination of activities directed at both Test and Evaluation Facility (TEF) and future Full Scale Repositories (FSR), however, prime emphasis is being placed on TEF tasks. In response to the redirection of the NWTS program, TTC activities in FY 1982 will focus on transportation of commercial high-level and transuranic waste, although spent fuel will still be considered. Consistent with the TEF and FSR design development schedules, the transportation system and receiving facility interface technology task will receive increased emphasis in FY 1983, while the logistics and NEPA compliance tasks will continue to be major program areas. (ERA citation 06:034390)

DE81030844 PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Disruption Scenarios for a Nuclear-Waste Repository on the Nevada Test Site.
R. L. Link, F. W. Bingham, and G. E. Barr. 1981, 6p
CONF-811119-1
Contract AC04-76DP00789
NWTS program information meeting, Columbus, OH, USA, 17 Nov 1981.

Scenarios are being constructed for the release of radioactive material from hypothetical repositories in different types of rock at NTS. Deductive event trees are constructed; each path through an event tree is a scenario. The complete set of NTS event trees comprises about 340 scenarios, not counting the multiple paths through the subtrees made by expanding complex events. Each of these scenarios is being analyzed for 10 different types of rocks. (ERA citation 06:034397)

DE81030992 PC **E05**/MF **E05**
Department of Energy, Washington, DC. Office of Nuclear Waste Management and Fuel Cycle Programs.
Draft Environmental Impact Statement: Defense Waste Processing Facility, Savannah River Plant, Aiken, SC.
Sep 81, 456p DOE/EIS-0082D

The purpose of this Environmental Impact Statement (EIS) is to provide environmental input into both the selection of an appropriate strategy for the permanent disposal of the high-level radioactive waste (HLW) currently stored at the Savannah River Plant (SRP) and the subsequent decision to construct and operate a Defense Waste Processing Facility (DWPF) at the SRP site. The SRP is a major US Department of Energy (DOE) installation for the production of nuclear matrials for national defense. Approximately 83 x 10 exp 3 m exp 3 (22 million gal) of HLW currently are stored in tanks at the SRP site. The proposed DWPF would process the liquid HLW generated by SRP operations into a stable form for ultimate disposal. This EIS assesses the effects of the proposed immobilization project on land use, air quality, water quality, ecological systems, health risk, cultural resources, endangered species, wetlands protection, resource depletion, and regional social and economic systems. The radiological and nonradiological risks of transporting the immobilized wastes are assessed. The environmental impacts of disposal alternatives have recently been evaluated in a previous EIS and are therefore only summarized in this EIS. (ERA citation 06:034398)

DE82000035 PC **A10**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Preliminary Technical Data Summary for the Defense Waste Processing Facility, Stage 1.
Sep 80, 213p DPSTD-80-38
Contract AC09-76SR00001

This Preliminary Technical Data Summary presents the technical basis for design of Stage 1 of the Staged Defense Waste Processing Facility (DWPF), a process to efficiently immobilize the radionuclides in Savannah River Plant (SRP) high-level liquid waste. The radionuclides in SRP waste are present in sludge that has settled to the bottom of waste storage tanks and in crystallized salt and salt solution (supernate). Stage 1 of the DWPF receives washed, aluminum dissolved sludge from the waste tank farms and immobilizes it in a borosilicate glass matrix. The supernate is retained in the waste tank farms until completion of Stage 2 of the DWPF at which time it filtered and decontaminated

by ion exchange in the Stage 2 facility. The decontaminated supernate is concentrated by evaporation and mixed with cement for burial. The radioactivity removed from the supernate is fixed in borosilicate glass along with the sludge. This document gives flowsheets, material, and curie balances, material and curie balance bases, and other technical data for design of the Stage 1 DWPF. (ERA citation 06:034378)

DE82000408 PC **A03**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Licensing Schedule for Away-from-Reactor (AFR) Spent Fuel Storage Facilities.
P. L. Gray. Aug 81, 26p DP-1582
Contract AC09-76SR00001

The Nuclear Regulatory Commission has authority to issue licenses for Away-From-Reactor (AFR) installations for the storage of spent nuclear fuel. This report presents a detailed estimate of the time required to prosecute a licensing action. The projected licensing schedule shows that the elapsed time between filing an application and issuance of a license will be about 32 months, assuming intervention. The legal procedural steps will determine the time schedule and will override considerations of technical complexity. A license could be issued in about 14 months in the absence of intervention. (ERA citation 06:034359)

DE82000522 PC **A07**/MF **A01**
Oak Ridge National Lab., TN.
Socioeconomic Assessment of Defense Waste Processing Facility Impacts in the Savannah River Plant Region.
E. Peelle, J. H. Reed, and R. H. Stevenson. Sep 81. 138p ORNL/TM-7893
Contract W-7405-ENG-26

The DWPF will immobilize highly radioactive defense wastes for storage on site until shipment to an approved federal repository for radioactive wastes. This document assesses the socioeconomic impacts of constructing and operating the proposed facility and presents the assessment methodology. Because various schedules and various ways of staging the construction of the DWPF are considered and because in some of these instances a large nearby construction project (the Vogtle Nuclear Power Station) may influence the socioeconomic impacts, four scenarios involving different facility options and schedules are assessed. In general, the impacts were found not to be large. In the scenario where the socioeconomic effects were the greatest, it was found that there are likely to be some impacts on schools in Barnwell County as well as a shortage of mobile homes in that county. Aiken, Allendale, and Bamberg counties are also likely to experience slight-to-moderate housing shortages. Minor impacts are anticipated for fire and police services, roads, traffic, and land use. There will be noticeable economic impact from the project. Other scenarios had fewer socioeconomic impacts. (ERA citation 06:035470)

DE82000708 PC **A04**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Survey of Matrix Materials for Solidified Radioactive High-Level Waste.
W. E. Gurwell. Sep 81, 58p PNL-3512
Contract AC06-76RL01830

Pacific Northwest Laboratory (PNL) has been investigating advanced waste forms, including matrix waste forms, that may provide a very high degree of stability under the most severe repository conditions. The purpose of this study was to recommend practical matrix materials for future development that most enhance the stability of the matrix waste forms. The functions of the matrix were reviewed. Desirable matrix material properties were discussed and listed relative to the matrix functions. Potential matrix materials were discussed and recommendations were made for future matrix development. The matrix mechanically contains waste cores, reduces waste form temperatures, and is capable of providing a high-quality barrier to leach waters. High-quality barrier matrices that separate and individually encapsulate the waste cores are fabricated by powder fabrication methods, such as sintering, hot pressing, and hot isostatic pressing. Viable barrier materials are impermeable, extremely corrosion resistant, and mechanically strong. Three material classes potentially satisfy the requirements for a barrier matrix and are recommended for development: titanium, glass, and graphite. Polymers appear to be marginally adequate, and a more thorough engineering assessment of their potential should be made. (ERA citation 06:034384)

DE82000816 PC **A04**/MF **A01**
Ford, Bacon and Davis Utah, Inc., Salt Lake City.
Summary of the Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
Aug 81, 57p DOE/UMT-0106S, FBDU-360-19S
Contract AC04-76GJ01658

Ford, Bacon, and Davis Utah Inc. has reevaluated the Riverton site in order to revise the December 1977 engineering assessment of the problems resulting from the existence of radioactive uranium mill tailings at Riverton, Wyoming. This engineering assessment has included the preparation of topographic maps, the performance of core drillings and radiometric measurements sufficient to determine areas and volumes of tailings and radiation exposures of individuals and nearby populations, the investigations of site hydrology and meteorology, and the evaluation and costing of alternative corrective actions. Radon gas released from the 900,000 tons of tailings materials at the Riverton site constitutes the most significant environmental impact, although windblown tailings and external gamma radiation also are factors. The nine alternative actions presented in this engineering assessment range from millsite decontamination with the addition of 3 m of stabilization cover material (Option I), to removal of the tailings to remote disposal sites and decontaminations of the tailings site (Options II through IX). Cost estimates for the nine options range from about $16,600,000 for stabilization in-place, to about $23,200,000 for disposal at a distance of 18 to 25 mi. Three principal alternatives for the reprocessing of the Riverton tailings were examined: (a) heap leaching; (b) treatment at an existing mill; and (c) reprocessing at a new conventional mill constructed for tailings reprocessing. The cost of the uranium recovered would be about $260 and $230/lb of U sub 3 O sub 8 by heap leach and conventional plant processes respectively. The spot market price for uranium was $25/lb early in 1981. Therefore, reprocessing the tailings for uranium recovery does not appear to be economically attractive. (ERA citation 06:034375)

DE82000817 PC **A09**/MF **A01**
Ford, Bacon and Davis Utah, Inc., Salt Lake City.
Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
Aug 81, 176p DOE/UMT-0106, FBDU-360-19
Contract AC04-76GJ01658

Ford, Bacon and Davis Utah Inc. has reevaluated the Riverton site in order to revise the December 1977 engineering assessment of the problems resulting from the existence of radioactive uranium mill tailings at Riverton, Wyoming. This engineering assessment has included the preparation of topographic maps, the performance of core drillings and radiometric measurements sufficient to determine areas and volumes of tailings and radiation exposures of individuals and nearby populations, the investigations of site hydrology and meteorology, and the evaluation and costing of alternative corrective actions. Radon gas released from the 900,000 tons of tailings materials at the Riverton site constitutes the most significant environmental impact, although windblown tailings and external gamma radiation also are factors. The nine alternative actions presented in this engineering assessment range from millsite decontamination with the addition of 3 m of stabilization cover material (Option I), to removal of the tailings to remote disposal sites and decontamination of the tailings site (Options II through IX). Cost estimates for the nine options range from about $16,600,000 for stabilization in-place, to about $23,200,000 for disposal at a distance of 18 to 25 mi. Three principal alternatives for the reprocessing of the Riverton tailings were examined: heap leaching; treatment at an existing mill; and reprocessing at a new conventional mill constructed for tailings reprocessing. The cost of the uranium recovered would be about $260 and $230/lb of U sub 3 O sub 8 by heap leach and conventional plant processes, respectively. The spot market price for uranium was $25/lb early in 1981. Therefore, reprocessing the tailings for uranium recovery does not appear to be economically attractive. (ERA citation 06:034400)

DOE/EV-0046(V.2) PC **A99**/MF **A01**
Department of Energy, Washington, DC. Div. of Environmental Control Technology.
Proceedings of the US Department of Energy Environmental Control Symposium. Volume 2. Nuclear Energy and Transportation.
Sep 79, 617p CONF-781109-(V.2)
Contract W-31-109-ENG-38
Environmental control symposium, Washington, DC, USA, 28 Nov 1978.

Volume 2 contains papers from the following sessions: environmental control of fission/fusion power; nuclear waste disposal; decontamination and decommissioning; environmental control aspects of transportation; and hazardous materials transportation. Individual papers were processed. (ERA citation 05:002670)

IDO-10085 PC **A23**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Environmental and Other Evaluations of Alternatives for Long-Term Management of Buried INEL Transuranic Waste.
Dec 79, 527p
Contract EY-76-C-07-1570

This study identifies, develops, and evaluates, in a preliminary manner, alternatives for long-term management of the TRU waste buried at the RWMC at the INEL. The technology required for managing the waste, the environmental effects, the risks to the public, the radiological and nonradiological hazards to workers, and the estimated costs are discussed. The RWMC was established in the southwestern corner of the INEL in 1952 as a controlled area for burial of solid radioactive waste generated by INEL operations. It encompasses about 144 acres. Since 1954, solid waste contaminated with transuranic radionuclides has been received from defense-related activities at the RFP and from other operations of the AEC and its successor agencies. Approximately 2,200,000 ft exp 3 of TRU waste was buried in pits and trenches at the RWMC between 1954 and 1970. Since 1970, about 1,100,000 ft exp 3 of TRU waste has been received and stored retrievably on aboveground asphalt pads at the RWMC. The containers (metal bins and drums and wooden boxes) for the stored waste are generally in good condition. However, the containers for the buried waste have deteriorated badly; some of the waste, such as large pieces of equipment, was buried without containers. Some of the soil immediately adjacent to the buried waste has become contaminated. Six alternatives for the long-term management of the buried TRU waste were studied. These alternatives are identified and concepts within these alternatives developed and evaluated. (ERA citation 05:011346)

LA-7857 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Low-Level Transuranic Waste Assay by Photon Interrogation and Moderated Neutron Counting.
M. R. Cates, L. A. Franks, B. W. Noel, J. L. Pigg, and D. A. Close. Oct 79, 17p
Contract W-7405-ENG-36

When fission is induced in trace amounts of transuranic contaminants in waste material, it provides signatures from fission products that can be used to assay the material before disposal. Given here are the results from counting photofission-induced delayed neutrons from exp 239 Pu in sample matrices. When delayed neutrons emitted after 5 min of photon irradiation with energies up to 18 MeV in 1-l samples are counted, assay limits of 10 to 100 nCi/g for matrices with a density of up to 5 g/cm exp 3 are determined. Counting all delayed neutron emissions or some prompt neutrons improves sensitivities by a factor of 20 or more. The dynamics of photofission and delayed neutron production, use of an electron linear accelerator as a particle source, experimental and electronic details, and future experimental plans are discussed. 15 figures, 3 tables. (ERA citation 05:004071)

LA-7921-PR PC **A04**/MF **A01**
Los Alamos Scientific Lab., NM.
Nuclear Waste Management Technology Development Activities. Progress Report, January-December 1978.
L. J. Johnson, and B. H. Desilets. Jun 79, 73p
Contract W-7405-ENG-36

Summary reports describe progress in Los Alamos Scientific Laboratory (LASL) Health Research Division managed programs by the nuclear waste management task area for calendar year (CY) 1978. Development and application of assay instrumentation for measuring the radioactivity content of waste packages is report-

ed. Work in developing test materials and laser-based instrumentation for in-place testing of high-efficiency particulate aerosol filters is discussed. Development and demonstration of a controlled air incinerator for treatment of radioactively contaminated combustible waste is described. Field data from the environmental geology and hydrology aspect of shallow earth disposal of radioactively contaminated waste are reviewed and related to improvement of land burial technology. (ERA citation 05:002595)

LBL-10193(Rev.) PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Thermomechanical Modeling and Data Analysis for Heating Experiments at Stripa, Sweden.
T. Chan, N. Littlestone, and O. Wan. Nov 79, 11p
CONF-800507-7(Rev.)
Contract W-7405-ENG-48
Rock mechanics symposium, Rolla, MO, USA, 27 May 1980.

Comparisons were made between predicted and measured thermomechanical displacements and stresses for in situ heating experiments at a depth of 340 m in a granite body at Stripa, Sweden. We found that taking into account the temperature dependence of the thermal expansion coefficient and the mechanical properties of the rock substantially improves the agreement between theory and experiment. In general, the displacements calculated using laboratory values of rock properties agree better with field data than in the case of stresses. This may be due to the difference between in situ and laboratory rock modulus. The significance of temperature-dependent rock properties and strength to thermomechanical failure is also discussed. (ERA citation 05:026986)

NUREG/CR-2418 PC **A08**/MF **A01**
Toledo Univ., OH. Dept. of Geology.
Durability of Simulated Supercalcine Ceramics at Geologic Storage Conditions.
Final rept.,
M. W. Phillips, A. I. Kilinc, Kwo-Ling Chyi, J. W. Shade, and E. L. Wegert. Nov 81, 169p

Two simulated high Na supercalcines, SPC-7a-2 and SPC-8a-5, have been studied. The apatite, spinel and corundum phases were confirmed in SPC-8a-5 as well as an amorphous phase containing Si, Al, Ca, Fe, and Na. Other phases tentatively identified include scheelite, nepheline, ZrO2 and Cs-molybdate. No pollucite was found perhaps because of excessive waste loading and/or inappropriate firing of calcine/additive mixture. Hydrothermal experiments were performed at 300, 400 and 500 C and 1Kb pressure on supercalcine and supercalcine/basalt using deionized water and 0.1, 0.5, and 1.0M NaCl solutions. The apatite, spinel and corundum phases showed extensive development of crystal faces during hydrothermal treatment. The Cs-molybdate and amorphous phases disappeared. New phases produced include acmite, Cs-analcime, Ba aluminosilicate and perhaps powellite. Two types of diffusion experiments were performed on supercalcine and host rocks (basalt, granite and shale) employing a 300C/cm gradient. Results indicate that concentration gradient is the most important factor controlling waste component mobility followed by temperature gradient. Three theoretical models are presented to predict component migration (concentration vs. distance) as a function to time.

N82-11889/4 PC **A16**/MF **A01**
Boeing Aerospace Co., Seattle, WA.
Analysis of Space Systems Study for the Space Disposal of Nuclear Waste Study Report. Volume 2: Technical Report.
Final Report.
1981, 360p NASA-CR-161888, D180-26426-2-V-2
Contract NAS8-33847

Reasonable space systems concepts were systematically identified and defined and a total system was evaluated for the space disposal of nuclear wastes. Areas studied include space destinations, space transportation options, launch site options payload protection approaches, and payload rescue techniques. Systems level cost and performance trades defined four alternative space systems which deliver payloads to the selected 0.85 AU heliocentric orbit destination at least as economically as the reference system without requiring removal of the protective radiation shield container. No concepts significantly less costly than the reference concept were identified.

ORNL/OIAPA-13 PC **A04**/MF **A01**
Oak Ridge National Lab., TN.
Public Information on Radioactive Waste: A Study of an Emerging Issue.
L. M. Bronfman, B. H. Bronfman, and J. L. Regens. Oct 79, 59p
Contract W-7405-ENG-26

Through an analysis of information provided in the printed media on the topic of radioactive waste, the study analyzes the emergence of radioactive waste as a public issue in the press. Over eight hundred articles printed in both specialized and non-specialized sources from 1973 to 1978 have been content-analyzed in order to describe how the problem of radioactive waste is defined and what dimensions of the problems are receiving attention. Between 1973 and 1978, there was a substantial increase in the amount of information on the topic of radioactive waste available to the public through a variety of popular and specialized media sources. This increase coincides with documented public concern with the problem of radioactive waste. Discussions of radioactive waste have focused for all sources more frequently on themes not directly related to the technical problems of radioactive waste storage or isolation. A substantial amount of the information available to a variety of segments of the public is composed of discussions of real or perceived risk related to the existence of waste or to methods of disposing of it. In addition to risk, a substantial proportion of the discussions deal with institutional themes. Over time, the total amount of information on most dimensions of the radioactive waste problem has increased substantially. Institutional themes have gained relative to other issues over the three time periods. National and local press sources infrequently specify the form of waste being discussed thus providing evidence that the quality of technical information available to some members of the public is very low. (ERA citation 05:004072)

ORNL/SUB-79/13837/1 PC **A06**/MF **A01**
Gilbert/Commonwealth, Jackson, MI.
State of the ART Review of Alternatives to Shallow Land Burial of Low Level Radioactive Waste.
Apr 80, 101p
Contract W-7405-ENG-26

A review of alternatives to shallow land burial for disposal of low level radioactive waste was conducted to assist ORNL in developing a program for the evaluation, selection, and demonstration of the most acceptable alternatives. The alternatives were categorized as follows: (1) near term isolation concepts, (2) far term isolation concepts, (3) dispersion concepts, and (4) conversion concepts. Detailed descriptions of near term isolation concepts are provided. The descriptions include: (1) method of isolation, (2) waste forms that can be accommodated, (3) advantages and disadvantages, (4) facility and equipment requirements, (5) unusual operational or maintenance requirements, (6) information/technology development requirements, and (7) related investigations of the concept. (ERA citation 05:020170)

PB82-138397 PC **E09**/MF **E09**
Commission of the European Communities, Luxembourg.
The Dutch Geologic Radioactive Waste Disposal Project.
Final rept.,
J. Hamstra, and B. Verkerk. c1981, 236p EUR-7151-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Work on the geological disposal of radioactive waste in salt domes carried out in the Netherlands during 1978-79 is reviewed. Work undertaken since then is reported in four annexes. Annex 1 describes the development of a model to predict the consequences of radioactive release following accidental flooding of a repository for vitrified high-level waste in a salt dome. Annex 2 analyzes the minimum and maximum rock salt temperatures in different configurations and recommends a study of the effect of thermal expansion. Annex 3 provides details of the design and construction of a salt-dome repository for nuclear wastes, including the sinking and construction of the shafts underground, haulage, ventilation, and the different plugging and sealing procedures for the disposal boreholes and the shafts. Annex 4 contains a description of a borehole drilling experiment carried out with air flushing in the Asse II salt mine.

PB82-859307 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Marine Disposal of Radioactive Wastes. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for Jan 78-Dec 81.
Dec 81, 166p

This bibliography contains citations concerning the disposal of high and low level liquid and solid radioactive wastes in the sea and ground water. Emphasis is on the disposal of the wastes at sea. Disposal under and on the sea bed is examined, and the migration and concentration of radioactive wastes in sea water and acquatic life are included. Methodology for measuring radioactivity is considered. (Contains 130 citations fully indexed and including a title list.)

PB82-859422 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Zeolites in Radioactive Applications. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 127p
Supersedes PB81-855983. Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography covers zeolites used as ion exchangers for the processing, separation, disposal, and storage of radioactive wastes. The characteristics and performance of zeolites in these applications are considered in general terms and for specific radioactive materials and specific locations and facilities. (This updated bibliography contains 107 citations, 32 of which are new entries to the previous edition.)

18H. Radioactivity

AD-A107 394/9 PC **A04**/MF **A01**
Westinghouse Research and Development Center, Pittsburgh, PA.
Charged Particle Simulation of Fast Neutron Damage.
Final rept. 1 Jan 76-31 Oct 81,
W. J. Choyke, J. A. Spitznagel, and R. M. More. 22 Oct 81, 69p Rept no. 81-9F3-SIMFN-R1
Contract N00014-76-C-0482

The motivation of this work is to compare atomic damage configurations associated with neutron and fast-ion damage. The question we set out to answer was: Which choice of ion mass and kinetic energy provides the best simulation of fast neutron damage. The answer which emerges is that the primary damage state, i.e. the statistical distribution of free defects, and subcascade regions before annealing, is remarkably independent of the ion species and its PKA spectrum. Experimentally single crystals of Mo were bombarded with 86Kr, 20Ne, 11B, 4He, and 1H in such a manner that the energy deposited into elastic collisions (displacement events) in the near surface region was approximately equal for each implant. The ion fluences spanned more than two orders of magnitude, and the resulting damage level at each fluence was monitored by obtaining aligned backscattered (channeling) spectra in a <111> axial direction. As an additional check on the channeling results selected implants were also examined with TEM. The channeling experiments clearly show that the final damage state, at all fluences, for 86Kr and 20Ne is the same. At low fluences, the final damage state for 86Kr, 20Ne, 11B, and 4He appears to be the same, but for high fluences there are unresolved difficulties with the 11B and 4He channeling results.

DE81030827 PC **A03**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
In-Situ High-Resolution gamma-Spectrometric Survey of Burial Ground-Monitoring Wells.
W. W. Bowman. Sep 81, 40p DP-1598
Contract AC09-76SR00001

In situ high resolution gamma-ray spectrometry with an intrinsic germanium detector assembly of special design surveyed the burial ground monitoring wells to locate and identify gamma emitters that may have migrated from the burial trenches toward the water table.

Gamma-ray spectra were acquired as a function of depth in each well and recorded on magnetic tape. These spectra were reduced by a series of computer programs to produce count rate versus depth profiles for natural and man-made activities. The original spectra and the profiles have been archived on magnetic tape for comparison with similar future surveys. Large amounts of man-made activities were observed in some of the burial trenches; however, below the trench bottoms, only very low but detectable amounts of exp 60 Co and exp 137 Cs were observed in eleven wells. The highest level of man-made gamma activity observed below the trench bottoms has a count rate roughly equal to that observed for uranium daughter activities which are natural to the subsoil. (ERA citation 06:034401)

DE82000434 PC **A02**/MF **A01**
EG and G, Inc., Las Vegas, NV. Energy Measurements Group.
Aerial Radiological Survey of the United States Department of Energy's Pantex Plant and Surrounding Area Amarillo, Texas. Date of Survey: October 1979.
P. K. Boyns. Jul 81, 24p EGG-1183-1768
Contract AC08-76NV01183

An aerial radiological survey was conducted over the United States Department of Energy's Pantex Plant and Pantex Lake areas in October, 1979. The Pantex Plant survey covered an area of approximately 64 km exp 2 . The Pantex Lake survey area was approximately 2 km exp 2 . Both areas were surveyed at an altitude of 46 m (150 feet) with lines spaced at 91 m (300 foot) intervals. Several passes were also made over the shipping areas at the Amarillo International Airport. An array of sodium iodide detectors were mounted in a helicopter to collect gamma ray spectral data. As expected, the spectral data indicated the presence of several areas containing man-made sources. (ERA citation 06:035444)

DE82000697 PC **A05**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Radiation Dose Rates from Commercial PWR and BWR Spent Fuel Elements.
C. E. Willingham. Oct 81, 88p PNL-3954
Contract AC06-76RL01830

Data on measurements of gamma dose rates from commercial reactor spent fuel were collected, and documented calculated gamma dose rates were reviewed. As part of this study, the gamma dose rate from spent fuel was estimated, using computational techniques similar to previous investigations into this problem. Comparison of the measured and calculated dose rates provided a recommended dose rate in air versus distance curve for PWR spent fuel. (ERA citation 06:034385)

LBL-11192 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Annual Environmental Monitoring Report of the Lawrence Berkeley Laboratory, 1979.
G. E. Schleimer. Jun 80, 23p
Contract W-7405-ENG-48

Monitoring data obtained for the calendar year 1979 are described, and general trends are discussed. The following areas are covered: accelerator produced radiation; radionuclide measurements and release (atmospheric, water, and sewer sampling); population dose equivalent resulting from LBL operations; and nonradioactive pollutants. Over the past several years the atmospheric sampling program has, with the exception of occasional known releases, yielded data which are within the range of normal background. The surface water program always yields results within the range of normal background. As no substantial changes in the quantities of radionuclides used are anticipated, no changes are expected in these observations. (ERA citation 05:034138)

MLM-2700 PC **A03**/MF **A01**
Mound Facility, Miamisburg, OH.
Annual Environmental Monitoring Report: Calendar Year 1979.
B. M. Farmer, and D. G. Carfagno. 25 Apr 80, 49p
Contract EY-76-C-04-0053

The local environment surrounding Mound Facility was monitored primarily for tritium and plutonium-238. The results are reported for CY-1979. The environmental parameters analyzed included air, water, vegetation, foodstuffs, and sediment. The average concentrations of plutonium-238 and tritium were within the applicable standards for radioactive species. (ERA citation 05:021178)

NUREG/CR-1241-V4 PC **A06**/MF **A01**
Hanford Engineering Development Lab., Richland, WA.
LWR Pressure Vessel Irradiation Surveillance Dosimetry.
Quarterly progress rept. Oct-Dec 80,
G. L. Guthrie. Nov 81, 125p HEDL-TME-80-6
See also NUREG/CR-1241-V2.

The Light Water Reactor Pressure Vessel (LWR-PV) Surveillance Dosimetry Improvement Program has been established by NRC in recognition of the importance of improving, maintaining, and standardizing neutron dosimetry, damage correlation, and the associate reactor analysis data and procedures used for predicting the integrated effect of neutron exposure to LWR pressure vessels. A vigorous research effort attacking the same measurement and analysis problems exists worldwide, and strong cooperative links between the USNRC supported activities at HEDL, ORNL, NBS, and NRL and those supported by CEN/SCK (Mol, Belgium), EPRI (Palo Alto, USA), KFA (Julich, Germany), and several UK laboratories have been extended to a number of other countries and laboratories. These cooperative links have been strengthened by the active membership of the scientific staff of many of the participating countries and laboratories in the ASTM E10 Committee on Nuclear Technology and Applications. Several subcommittees of ASTM E10 are responsible for the preparation of LWR-PV surveillance standards.

NUREG/CR-2227 PC **A09**/MF **A01**
Brookhaven National Lab., Upton, NY.
Radioactive Materials Released from Nuclear Power Plants.
Annual rept.,
J. Tichler, and C. Benkovitz. Nov 81, 193p BNL-NUREG-51416
See also NUREG-CR-1497.

Releases of radioactive materials in airborne and liquid effluents from commercial light water reactors during 1979 have been compiled and reported. Data on solid waste shipments as well as selected operating information have been included. This report supplements earlier annual reports issued by the former Atomic Energy Commission and the Nuclear Regulatory Commission. The 1979 release data are compared with previous years' releases in tabular form. Data covering specific radionuclides are summarized.

NVO-192(V.1) PC **A15**/MF **A01**
Holmes and Narver, Inc., Mercury, NV.
Selected Environmental Plutonium Research Reports of the NAEG.
M. G. White, and P. B. Dunaway. Jun 78, 348p
CONF-780212-(V.1)
Contract EY-76-C-08-0020
Plutonium information conference, San Diego, CA, USA, 28 Feb 1978.

Twenty-one papers were presented on various aspects of plutonium and radioisotope ecology at the Nevada Test Site. This includes studies of wildlife, microorganisms, and the plant-soil system. Analysis and sampling techniques are also included. (ERA citation 05:016569)

ORO-3852-36 PC **A03**/MF **A01**
Texas A and M Research Foundation, College Station.
Plutonium in the Gulf of Mexico.
M. R. Scott, and P. F. Salter. 36p
Contract AS05-76EV03852

The geochemistry of fallout plutonium in the sediments of the Gulf of Mexico was studied. A series of sediment cores was collected in a traverse from the deep Gulf of Mexico to the Mississippi Delta. The cores were sliced into 1 cm intervals and analyzed for plutonium. Explanations for the variations in concentration are presented. (ERA citation 05:032815)

ORO-3852-37 PC **A03**/MF **A01**
Texas A and M Research Foundation, College Station.
Uranium and Thorium Series Nuclides in River Sediments and River Water.
M. R. Scott, and P. F Salter. 27p
Contract AS05-76EV03852

Large volume suspended sediment samples were taken from Rio Grande, Mississippi and Suwannee Rivers. These rivers drain arid, moderate and subtropical regions, respectively. The samples were taken to provide enough material to use for chemical fractionation leaching studies of the relationship between Pu and other nuclides with various components of the sediment. This work is still in progress and is described in detail in a separate section of the progress report. (ERA citation 05:032816)

ORO-3852-38 PC **A02**/MF **A01**
Texas A and M Research Foundation, College Station.
Uranium and Thorium Series Isotopes in Nearshore Marine Sediments.
M. R. Scott, and P. F Salter. 11p
Contract AS05-76EV03852

Measurements of U and Th series isotopes have been made on sediments most often as a means of estimating sediment accumulation rates. Therefore data are available for long half-life isotopes such as exp 230 Th and exp 231 Pa on slowly depositing deep-sea sediments, and for the short half-life isotopes such as exp 228 Th, exp 234 Th, and exp 210 Pb mostly on rapidly accumulating coastal sediment. Studies of U and Th series nuclides in sediments of rivers entering the Gulf have been described in a previous section of this progress report. The isotopic decay series are out of equilibrium at several steps in the series. The activity ratio of exp 234 U/ exp 238 U is greater than 1 in sediment and water samples in a few cases, and the exp 230 Th/ exp 234 U ratio is greater than 1 in most instances. In the case of the Mississippi River suspended sediment, an average of 0.93 dpm/gm exp 230 Th is present in excess of the amount of its parent exp 234 U. This excess exp 230 Th clearly must be added to the Gulf of Mexico by the river. The Gulf of Mexico sediments have been reported to have unusually high U concentrations. We have therefore begun a study of U, Th, Pa, Ra, and Pb isotopes in the sediments of this system, including the nearshore marine area of the Mississippi River Delta. The preliminary results are discussed in this report. (ERA citation 05:032817)

18I. Reactor Engineering and Operation

AD-A106 918/6 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Update of Cost Information Contained in a Previous GAO Report on Specific Aspects of the Clinch River Breeder Reactor Project.
26 Jun 81, 21p Rept no. GAO/EMD-81-112

As part of our June 23, 1977, report, the Energy Research and Development Administration (ERDA)--now part of the Department of Energy (DOE)--provided us with some cost and schedule information for the Clinch River Breeder Reactor Project as it related to three different licensing cases. At the time, the administration was attempting to terminate the Clinch River Project. And then, as now, it was a topic of heated debate within the Congress and between the Congress and the executive branch. Consequently, it was against this backdrop that we asked ERDA officials to provide us with specific cost and schedule data for the Clinch River Project, assuming it would be terminated and then restarted about 4 months later, after the Congress had an opportunity to fully consider whether to go ahead with the entire breeder reactor program. At the time, we used the 4-month lapse as an estimate that would provide an indication of the impact the project termination would have on the Clinch River Project's cost and schedule. (Author).

DE81025940 PC **A02**/MF **A01**
General Electric Co., Sunnyvale, CA.
Engineering Design Study.
8p DOE/SF/01435-T6
Contract AC03-77SF01435

Differences between GCFR and LMFBR assemblies are listed and the implications for the staggered-grid spacer discussed. It is concluded that the GE staggered-grid spacer appears to be a feasible option for the GCFR. Assumptions and constraints for the GCFR

fuel fabrication cost study are listed. (ERA citation 06:034822)

DE81027367 PC **A02**/MF **A01**
General Electric Co., Sunnyvale, CA. Advanced Reactor Systems Dept.
FFTF MOTA: Design Thermal and Stress Overcheck Analyses.
F. Yung, and J. Marshall. Jun 78, 3p DOE/SF/71031-T25
Contract AT03-76SF71031

This report describes a preliminary study of temperature distribution and stress level for the FTR material open test assembly (MOTA) specimen cannister. Upper bound thermal results are produced with the binary gas mixture Helium/Argon ratio equal to 0.0001 coupled with 2.0 watts/gram and 6.0 watts/gram gamma heating for the stainless steel structure and specimens. (ERA citation 06:034793)

DE81027453 PC **A03**/MF **A01**
General Electric Co., Sunnyvale, CA. Advanced Reactor Systems Dept.
Blowdown Transients and Implication for Leak Protection Shutdown Strategy.
P. M. Magee. Apr 80, 32p DOE/SF/70030-T45
Contract AT03-76SF70030

The creep-fatigue damage due to a blowdown transient is independent of the rate of water-side blowdown following isolation. The damage depends primarily upon plant system characteristics which set the rate of IHTS sodium cooldown after reactor scram and main pump trip. The time delay between a small leak alarm and reactor scram should be considered as a tradeoff between (1) providing time to confirm the existence of the leak to a reasonable level of assurance and (2) the potential for secondary tube wastage damage. In general, there appears to be no incentive to delay water-side blowdown following scram because the additional stress damage due to blowdown is insignificant and the potential for wastage damage should be eliminated as quickly as possible. One exception is the case of multiple evaporators feeding a superheater (as for CRBRP) where isolation and blowdown of one evaporator shortly after scram can cause significant additional stress damage to the superheater upper tubesheet. When initiated, the water-side blowdown process should be rapid. About 30 seconds blowdown time appears practical and adequate, based on the CRBRP design. (ERA citation 06:034846)

DE81030695 PC **A08**/MF **A01**
Oak Ridge National Lab., TN.
Development of Depletion Perturbation Theory for a Reactor Nodal Code.
S. M. Bowman. Sep 81, 165p ORNL/TM-7589
Contract W-7405-ENG-26

A generalized depletion perturbation (DPT) theory formulation for light water reactor (LWR) depletion problems is developed and implemented into the three-dimensional LWR nodal code SIMULATE. This development applies the principles of the original derivation by M.L. Williams to the nodal equations solved by SIMULATE. The present formulation is first described in detail, and the nodal coupling methodology in SIMULATE is used to determine partial derivatives of the coupling coefficients. The modifications to the original code and the new DPT options available to the user are discussed. Finally, the accuracy and the applicability of the new DPT capability to LWR design analysis are examined for several LWR depletion test cases. The cases range from simple static cases to a realistic PWR model for an entire fuel cycle. Responses of interest included K/sub eff/, nodal peaking, and peak nodal exposure. The nonlinear behavior of responses with respect to perturbations of the various types of cross sections was also investigated. The time-dependence of the sensitivity coefficients for different responses was examined and compared. Comparison of DPT results for these examples to direct calculations reveals the limited applicability of depletion perturbation theory to LWR design calculations at the present. The reasons for these restrictions are discussed, and several methods which might improve the computational accuracy of DPT are proposed for future research. (ERA citation 06:034833)

DE81030702 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Oak Ridge Research Reactor Quarterly Report, July, August, and September of 1980.
S. S. Hurt, III, and E. D. Lance. Sep 81, 30p ORNL/TM-7910
Contract W-7405-ENG-26

The ORR operated at an average power level of 29.6 MW for 90.5% of the time during July, August, and September of 1980. The reactor was shut down on twelve occasions, five of which were unscheduled. Reactor downtime needed for refueling, maintenance, and checks was normal, with the reactor remaining available for operation 93.5% of the time. Maintenance activities, both mechanical and instrument, were essentially routine in nature. (ERA citation 06:034843)

DE82000421 PC **A05**/MF **A01**
Texas Engineering Experiment Station, College Station.
Sixteenth Progress Report of the Texas A and M University Nuclear Science Center, January 1, 1979-December 31, 1979.
E. F. Bates, D. E. Feltz, J. P. Taft, G. S. Stasny, and K. L. Walker. Jun 80, 80p DOE/ER/04207-13, ORO-4207-13
Contract AC05-76ER04207

The Nuclear Science Center is operated by the Texas Engineering Experiment Station as a service to Texas A and M University and the State of Texas. The facility is available to the University, other educational institutions, governmental agencies, and private organizations and individuals. Reactor utilization continued to grow during 1979 with an increase in the total number of irradiations, sample irradiation hours, number of samples irradiated, and total experiment hours. Reactor operation of 85.71 Mw-days for 1979 was essentially the same as the previous year. The reactor was not pulsed during the reporting period due to a restriction on pulsing until the fuel damage study is completed. (ERA citation 06:034842)

DE82900055 PC **A13**/MF **A01**
Electric Power Research Inst., Palo Alto, CA.
Seminar on Countermeasures for Pipe Cracking in BWRs.
May 80, 277p EPRI-WS-79-174-V.4, CONF-800170-(Vol.4)
Seminar on countermeasures for pipe cracking in BWRs, Palo Alto, CA, USA, 22 Jan 1980.

Intergranular stress corrosion cracking of welded type 304 stainless steel in the recirculation piping of boiling water reactors has had an impact on plant availability and reliability since the fall of 1974. Investigations of this problem have resulted in significant progress in understanding the phenomenon and providing an engineering resolution by developing and qualifying countermeasures. A number of these countermeasures including solution heat treatment, corrosion resistant clad, alternate pipe materials, induction heating stress improvement and heat sink welding have been implemented. Separate abstracts are included for each of the papers presented. (ERA citation 06:034760)

EGG-LO-MR-007 PC **A06**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
LOFT Monthly Progress Report, May 1980.
N. C. Kaufman. Jun 80, 118p
Contract AC07-76ID01570

On May 29, 1980, the fifth in a series of nuclear experiments was conducted. The experiment, designated L6-5, simulated events which would follow a loss-of-feedwater to all of the steam generators of a large commercial nuclear powered reactor system. Initial results from the experiment indicate that all significant events occurred as expected. In addition to conducting Test L6-5, preparations continued for the next small-break test, L3-7. Currently, efforts for that test are ahead of schedule and targeted for 6/19/80. Costs to date are in good agreement with current budgets and authorized funding levels. (ERA citation 05:029065)

EPRI-NP-1000(V.3) PC **A09**/MF **A01**
Argonne National Lab., IL.
Optimization of Radially Heterogenous 1000-MW(E) LMFBR Core Configurations. Appendix C. Research Project 620-25.
W. P. Barthold, Y. Orechwa, S. F. Su, E. Hutter, and R. V. Batch. Nov 79, 191p
Contract W-31-109-ENG-38

A parameter study was conducted to determine the interrelated effects of: loosely or tightly coupled fuel regions separated by internal blanket assemblies, number of fuel regions, core height, number and arrangement of internal blanket subassemblies, number and size of fuel pins in a subassembly, etc. The effects of these parameters on sodium void reactivity, Doppler, incoherence, breeding gain, and thermohydraulics were of prime interest. Trends were established and ground work laid for optimization of a large, radially-heterogeneous, LMFBR core that will have low energetics in an HCDA and will have good thermal and breeding performance. (ERA citation 05:018858)

KFK-2785 PC **A02**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Inst. fuer Material- und Festkoerperforschung.
Simulation of the Chemical State of Irradiated Oxide Fuel; Influence of the Internal Corrosion on the Mechanical Properties of Zry-4 Tubing.
P. Hofmann. Mar 79, 22p CONF-790160-1
IAEA specialist's meeting on internal fuel rod chemistry, Erlangen, F.R. Germany, 23 Jan 1979.
U.S. Sales Only.

Zircaloy is not compatible with oxide fuel nor with some fission product elements. Therefore, chemical interaction between the irradiated oxide fuel and the Zry cladding material take place, especially at temperatures that can be reached during reactor incidents (ATWS, LOCA). In order to find out which influence the chemical interaction between the fission products and the Zry cladding material have on the mechanical properties of Zry-4 tubing out-of-pile burst experiments and creep rupture tests have been performed at temperatures $>=600$ exp 0 C with short tube specimens containing simulated fission products. First of all, assessments of the chemical state of irradiated oxide fuel were performed and a method is described for introducing simulated fission product species into fresh oxide fuel for irradiation tests. As the test results of the out-of-pile studies show, only iodine can lead to a low ductility failure of the Zry-tubing at temperatures $>=600$ exp 0 C. However, the influence of iodine on the deformation behavior of Zry-tubing can be neglected above 850 exp 0 C. (Atomindex citation 10:473864)

LA-UR-80-1459 PC **A04**/MF **A01**
Los Alamos Scientific Lab., NM.
Computational Methods for LMFBR Whole-Core Accident Analysis.
M. G. Stevenson, and J. F. Jackson. 1979, 52p
Contract W-7405-ENG-36

This chapter discusses the development of current state-of-the-art computational methods used in the United States for analysis of core meltdown accidents (Hypothetical Core Disruptive Accidents) in LMFBRs. The emphasis is on the phenomenological basis and numerical methods of the codes SAS, VENUS-II, SIMMER, and REXCO. (ERA citation 05:032323)

LA-UR-80-716 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
TRAC Posttest Calculations of Semiscale Test S-06-3.
J. R. Ireland, and P. B. Bleiweis. 1980, 6p CONF-800723-3
Contract W-7405-ENG-36
19. national heat transfer conference, Orlando, FL, USA, 27 Jul 1980.

A comparison of Transient Reactor Analysis Code (TRAC) steady-state and transient results with Semiscale Test S-06-3 (US Standard Problem 8) experimental data is discussed. The TRAC model used employs fewer mesh cells than normal data comparison models so that TRAC's ability to obtain reasonable results with less computer time can be assessed. In general, the TRAC results are in good agreement with the data and the major phenomena found in the experiment are reproduced by the code with a substantial reduction in computing times. (ERA citation 05:032321)

LA-8403-PR PC **A05**/MF **A01**
Los Alamos Scientific Lab., NM.
Reactor Technology. Progress Report, January-March 1980.
M. Breslow, and S. Sullivan. Jun 80, 88p
Contract W-7405-ENG-36

Progress is reported concerning space reactor (SPAR) electric power supply; GCFR reactor safety experi-

ments; structural analysis of HTGR, PWR, and BWR containment vessels and pressure vessels; heat pipe technology development; and nuclear criticality experiments and safety. (ERA citation 05:032267)

NUREG/CR-2106 PC **A03**/MF **A01**
Creare, Inc., Hanover, NH.
1/5-Scale Countercurrent Flow Data Presentation and Discussion.
Topical rept.,
C. J. Crowley, P. H. Rothe, and R. G. Sam. Nov 81, 50p CREARE-TN-333

Separate effects data for countercurrent flow behavior in a 1/5-scale PWR geometry are presented. The data represent the largest scale data of this type obtained up to the present time. A statistical analysis of these data has been performed and is also included here. The results of the statistical analysis are compared with analyses of data from smaller scale vessels. The trends in the data are consistent with trends indicated by the smaller scale data.

NUREG/CR-2182-V1 PC **A11**/MF **A01**
Oak Ridge National Lab., TN.
Station Blackout at Browns Ferry Unit One - Accident Sequence Analysis.
D. H. Cook, S. R. Greene, R. M. Harrington, S. A. Hodge, and D. D. Yue. Nov 81, 250p ORNL/NUREG/TM-455/V1
Contract W-7405-eng-26

The study describes the predicted response of Unit 1 at the Browns Ferry Nuclear Plant to Station Blackout, defined as a loss of offsite power combined with failure of all onsite emergency diesel-generators to start and load. Every effort has been made to employ the most realistic assumptions during the process of defining the sequence of events for this hypothetical accident. DC power is assumed to remain available from the unit batteries during the initial phase and the operator actions and corresponding events during this period are described using results provided by an analysis code developed specifically for this purpose. The Station Blackout is assumed to persist beyond the point of battery exhaustion and the events during this second phase of the accident in which DC power would be unavailable were determined through use of the MARCH code. Without DC power, cooling water could no longer be injected into the reactor vessel and the events of the second phase include core meltdown and subsequent containment failure. An estimate of the magnitude and timing of the concomitant release of the noble gas, cesium, and iodine-based fission products to the environment is provided in Volume 2 of this report.

NUREG/CR-2390 PC **A08**/MF **A01**
ANCO Engineers, Inc., Culver City, CA.
German Standard Problem 4a.
Technical rept. (Final) Oct 80-Sep 81,
W. B. Walton, G. H. Howard, and B. Johnson. Nov 81, 154p

This study deals with structural piping response to dynamic loads generated by hydraulic transients in nuclear power plants. Transients were induced by means of a rupture disc and closure of a feedwater check valve at the Heissdampfreaktor, West Germany. Blind predictions of piping response were made using the computer code EASE2. Comparison between computer simulations and experimental observations are contained in the report.

NUREG-0857 PC **A21**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Reactor Regulation.
Operation of Palo Verde Nuclear Generating Station, Units 1, 2, and 3; Docket Nos. STN-50-528, STN 50-529, and STN 50-530, Arizona Public Service Company, et al.
Safety evaluation rept.
Nov 81, 480p

The Safety Evaluation Report for the application filed by Arizona Public Service Company, et al, for licenses to operate the Palo Verde Nuclear Generating Station, Units 1, 2 and 3 (Docket Nos. STN 50-528/529/530), located in Maricopa County, Arizona has been prepared by the Office of Nuclear Reactor Regulation of the Nuclear Regulatory Commission. Subject to favorable resolution of the items discussed in the Safety Evaluation Report, the staff concludes that the plant can be operated by Arizona Public Service Company without endangering the health and safety of the public.

NUREG-0862-ISSUE 1 PC **A03**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Inspection and Enforcement.
Seismic Related Errors at Diablo Canyon Nuclear Power Plant, Units 1 and 2. Docket Nos. 50-275 and 50-323, License Nos. CPPR-39 and CPPR-69, Pacific Gas and Electric Company.
Inspection rept.,
B. H. Faulkenberry, A. D. Johnson, D. F. Kirsch, and P. J. Morrill. Nov 81, 31p

The report presents the results of a special inspection by NRC-Region V personnel to evaluate: The Quality Assurance Programs and other management control systems in effect at Pacific Gas and Electric and at URS/John A. Blume and Associates. During the period from 1970 to 1981; the extent to which these Quality Assurance Programs and management control systems were implemented as they relate to the development, transmittal, and use of safety related information, and, how the seismic related problems discovered at Diablo Canyon, during September-October, 1981, were caused and identified.

ORNL/SUB-7494/3 PC **A03**/MF **A01**
Westinghouse Electric Corp., Pittsburgh, PA. Nuclear Energy Systems Div.
Fuel Utilization Improvements in a Once-Through PWR Fuel Cycle. Final Report on Task 6.
D. Dabby. Jun 79, 43p WCAP-9547
Contract W-7405-ENG-26

In studying the position of the United States Department of Energy, Non-proliferation Alternative Systems Assessment Program, this report determines the uranium saving associated with various improvement concepts applicable to a once-through fuel cycle of a standard four-loop Westinghouse Pressurized Water Reactor. Increased discharged fuel burnup from 33,000 to 45,000 MWD/MTM could achieve a 12% U sub 3 O sub 8 saving by 1990. Improved fuel management schemes combined with coastdown to 60% power, could result in U sub 3 O sub 8 savings of 6%. (ERA citation 05:029004)

ORNL-5398(Exec.Sum.) PC **A04**/MF **A01**
Oak Ridge National Lab., TN.
Interim Assessment of the Denatured exp 233 U Fuel Cycle: Feasibility and Nonproliferation Characteristics.
L. S. Abbott, D. E. Bartine, and T. J. Burns. Dec 79, 74p
Contract W-7405-ENG-26

A fuel cycle that employs exp 233 U denatured with exp 238 U and mixed with thorium fertile material is examined with respect to its proliferation-resistance characteristics and its technical and economic feasibility. The rationale for considering the denatured exp 233 U fuel cycle is presented, and the impact of the denatured fuel on the performance of Light-Water Reactors, Spectral-Shift-Controlled Reactors, Gas-Cooled Reactors, Heavy-Water Reactors, and Fast Breeder Reactors is discussed. The scope of the R, D and D programs to commercialize these reactors and their associated fuel cycles is also summarized and the resource requirements and economics of denatured exp 233 U cycles are compared to those of the conventional Pu/U cycle. In addition, several nuclear power systems that employ denatured exp 233 U fuel and are based on the energy center concept are evaluated. (ERA citation 05:011898)

18J. Reactor Materials

DE82000082 PC **A02**/MF **A01**
General Atomic Co., San Diego, CA.
Effect of Microstructure on the Mechanical Properties of a Commercial 12Cr-1Mo Steel (HT-9).
T. A. Lechtenberg. Aug 81, 8p GA-A-16389, CONF-810831-57
Contract AT03-76ET51011
Fusion reactor materials meeting, Seattle, WA, USA, 9 Aug 1981.

The microstructure of a commercial 12Cr-1Mo steel (HT-9) and its associated effect on strength and toughness properties is being studied in a continuing program aimed at qualifying the alloy for use in fusion energy machines. Interim results show this alloy is subject to a degree of tempered martensite embrittlement and temper embrittlement. For applications projected for fusion machines at lower temperatures, a new heat treatment (1000 exp 0 C, 1 h, air-cooled followed by 650 exp 0 C tempering) at lower temperatures and shorter times than the vendor-recommended heat treatment has been identified. Microstructural differences between the treatments are discussed, and mechanical properties are correlated. 6 figures. (ERA citation 06:035189)

DE82900104 PC **A04**/MF **A01**
Electric Power Research Inst., Palo Alto, CA. Nuclear Power Div.
Planning Support Document for the EPRI Light-Water-Reactor Fuel-Rod-Performance Program.
J. T. A. Roberts, and F. E. Gelhaus. Dec 75, 73p EPRI-SR-25

The funded projects are listed by title, RP number, and contractor(s). Fuel Rod Studies: Zircaloy-Steam Oxidation Kinetics, EPRI/MPC Zircaloy-LOCA Project, EPRI/NASA Coop. Project on Zircaloy Stress Corrosion Cracking, Zircaloy Inelastic Deformation Study, Plutonia Fuel Study, UO sub 2 Cracking and Relocation Study, Halden Reactor Program Membership, EPRI Test Program in Halden - IFA 435, Studsvik BWR Overpower Ramp Test, and Fuel Rod Code Evaluation. Fuel Bundle Studies: EPRI/CE Coop. Project on PWR Fuel Performance, EPRI/B and W Coop. Project on PWR Fuel Performance, Plutonium Utilization in BWR's, EPRI/EXXON Project on Multiple Plutonium Recycle, and Quad Cities-1 Plutonium Recycle Nuclear and Fuel Performance Measurements. Core Studies: Fuel Performance Evaluation. (ERA citation 06:034839)

LA-UR-80-1069 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Fuel Damage Estimates for the TMI-2 Reactor.
W. L. Kirchner, J. R. Ireland, and P. K. Mast. 1980, 8p CONF-800403-42
Contract W-7405-ENG-36
ANS thermal reactor safety meeting, Knoxville, TN, USA, 8 Apr 1980.

A best-estimate postaccident analysis of the TMI-2 reactor system was made with the TRAC code. Based on these results, an assessment of the extent of damage to the TMI-2 reactor core was made; and several alternative event sequences and their consequences were investigated. Results indicate that although no significant fuel melting occurred, large regions of cladding were severely oxidized and clad melting and relocation took place in the central region of the core, above the midplane elevation. In the alternative event sequences, the timeliness of the initiation of HPI flow in preventing large scale fuel melting is examined. (ERA citation 05:024094)

LA-UR-80-741 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
In-Process Inventory Estimation for Pulsed Columns and Mixer-Settlers.
D. D. Cobb, L. E. Burkhart, and A. L. Beyerlein. 1980, 8p CONF-800315-12
Contract W-7405-ENG-36
Symposium of the European Safeguards Research and Development Association, Edinburgh, UK, 26 Mar 1980.

Nuclear materials accounting and control in fuels reprocessing plants can be improved by near-real-time estimation of the nuclear materials inventory in solvent-extraction contactors. Techniques are being developed for the estimation of the in-process inventory in contactors. These techniques are derived from recent developments in chemical modeling of contactor systems, on-line measurements for materials accounting and control of the Purex process, and computer-based data acquisition and analysis methods. (ERA citation 05:020209)

LA-8042(V.1) PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Materials Management in an Internationally Safeguarded Fuels Reprocessing Plant.
E. A. Hakkila, D. D. Cobb, H. A. Dayem, R. J. Dietz, and E. A. Kern. Apr 80, 7p
Contract W-7405-ENG-36

The first volume of this report summarizes the results and conclusions for this study of conventional and advanced nuclear materials accounting systems applicable for both large (1500 MTHM/y) and small (210 MTHM/y) spent-fuel reprocessing facilities subject to international verification. (ERA citation 05:025434)

LA-8042(V.3) PC **A12**/MF **A01**
Los Alamos Scientific Lab., NM.
Materials Management in an Internationally Safeguarded Fuels Reprocessing Plant.
E. A. Hakkila, A. L. Baker, and D. D. Cobb. Apr 80, 273p
Contract W-7405-ENG-36

The following appendices are included: aqueous reprocessing and conversion technology, reference facilities, process design and operating features relevant to materials accounting, operator's safeguards system structure, design principles of dynamic materials accounting systems, modeling and simulation approach, optimization of measurement control, aspects of international verification problem, security and reliability of materials measurement and accounting system, estimation of in-process inventory in solvent-extraction contactors, conventional measurement techniques, near-real-time measurement techniques, isotopic correlation techniques, instrumentation available to IAEA inspectors, and integration of materials accounting and containment and surveillance. (ERA citation 05:025436)

LA-8389-PR PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Fission Product Release. Progress Report, January 1-March 31, 1980.
A. E. Norris. Jun 80, 18p
Contracts W-7405-ENG-36, AC06-76RL0183

Iron foil was used this quarter to help produce reducing conditions in a basic aqueous environment that resulted in only 0.02 ppB uranium in solution from the dissolution of sintered UO sub 2 , after one week's contact time. This concentration of uranium is the lower limit of detection in our analytical procedure. Additional work with powdered UO sub 2 to understand the conditions that result in low solubilities of uranium in aqueous solution has resulted in measured uranium concentrations of 8 ppB when hydrogen is used with palladium-black as the reducing agent. Calculations for this system show that CO sub 2 in solution is not affecting the results at pH 6 or lower. Electron microprobe analyses of a spent fuel segment have been completed. Plutonium concentrations were higher in the outer 500 mu m of the fuel element than in the interior. Strontium, antimony, and cesium did not display any radial trends in concentrations. (ERA citation 05:032276)

LA-8463-MS PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Irradiated Fuel Inspection in a Storage Pond with No Fuel Movement and an Uncollimated Detector.
P. M. Rinard. Jul 80, 25p
Contract W-7405-ENG-36

It is assumed that the assemblies are not to be moved during the inspection in order to reduce the time required. The task is simplified further when the detector is well collimated. If the collimation is insufficient to respond to only one assembly from among an array of fuel assemblies, then an unfolding process is needed. A formulation of the detector's behavior is given followed by an unfolding process to yield the detector's response to each assembly as if it were isolated. Some simulated arrays are used to illustrate the sensitivity of the procedure to normal fluctuations in the measured quantities. Measurements with an ionization chamber on actual arrays of up to fourteen PWR assemblies are treated to provide a realistic application of the unfolding process. An unfolding technique is essential with a poorly collimated detector, but the examples warn that weak source strengths surrounded by much stronger sources will not be accurately recovered and even the detection of voids is thus uncertain. Some simulated arrays of up to 100 assemblies indicate that unacceptably inaccurate results may be caused by even the small normal fluctuations in measured values. Any use of an unfolding process is thus quite limited. (ERA citation 05:031668)

LBL-11030 PC **A05**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Nuclear Materials Research Progress Reports for 1979.
D. R. Olander. Dec 79, 81p
Contract W-7405-ENG-48

Research is presented concerning iodide stress corrosion cracking of zircaloy, self-diffusion of oxygen in hypostoichiometric urania, surface chemistry of epitaxial silicon deposition by thermal cracking of silane, kinetics of laser pulse vaporization of UO sub 2 , gas laser model for laser induced evaporation, solubility of hydrogen in uranium dioxide, thermal gradient migration of metallic inclusions in UO sub 2 , molecular beam studies of atomic hydrogen reduction of oxides, and thermal gradient brine-inclusion migration in salt. (ERA citation 05:032578)

NBL-296 PC **A02**/MF **A01**
Department of Energy, Argonne, IL. New Brunswick Lab.
Dissolution of HTGR TRISO Beads by the Alkali Fluoride Fusion Method.
S. E. Byster. Jul 80, 9p

The alkali fluoride fusion method for the dissolution of HTGR TRISO fuel beads offers significant time advantage over other commonly used fusion procedures when applied to samples weighing less than three grams. The method is straightforward, utilizes standard analytical laboratory equipment, and yields solutions which may be utilized by customary procedures. (ERA citation 05:033308)

NUREG/CR-1589 PC **A08**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Pathfinding Simulation (PATHS) User's Guide,
Dennis Engi, Jay S. Shanken, and P. W. Moore. Sep 81, 172p SAND-80-1626
Prepared in cooperation with Tech. Reps., Inc., Albuquerque, NM.

The interactive Pathfinding Simulation (PATHS) computer program treats the stochastic shortest route problem through the use of a Monte Carlo technique. This program is described in its application to the evaluation and design of facility security systems that are used for protection against sabotage and theft. By making use of an efficient algorithm for focusing upon only the relatively critical routes (from a security viewpoint), PATHS obviates the need to identify and evaluate each and every complete potential route. As a result, the PATHS procedure permits facility analyses that would otherwise be beyond the capabilities of current generation computers. Input requirements, input modifications, output options, and interpretation of the output are presented, and examples are given of simulations that apply to a hypothetical facility.

ORNL/TM-6264 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Partial Thermal Denitration of Uranyl Nitrate Solutions in a Screw Denitrator.
H. D. Ringel, and P. A. Haas. Aug 78, 38p
Contract W-7405-ENG-26

Weak-acid ion exchange resin is loaded with uranium by acid-deficient uranyl nitrate solutions that have a nitrate uranium ratio of about 1.6. Processing this solution from an acid-excess uranyl nitrate solution by thermal denitration in a screw denitrator is described. Direct processing of this solution resulted in an insufficient acid deficiency of about C/sub N//C/sub U/ = 1.8. Therefore, the process was modified; a highly denitrated UO sub 3 slid was processed with C/sub N//C/sub U/ = 0.2, and this solid was subsequently dissolved to prepare acid-deficient uranyl nitrate solution or slurry. A detailed flowsheet for this process is given. The proposed combined screw denitrator-dissolver unit may meet the process requiements with improved efficiency. (ERA citation 05:002576)

18K. Reactor Physics

CEA-CONF-4492 PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Cadarache, Saint-Paul-les-Durance (France). Dept. des Reacteurs a Eau.
SPH Homogeneization Method.
A. Kavenoky. 1978, 8p CONF-7811105-2
IAEA/NEACRP specialist meeting on homogenization methods in physics/reactor, Wurenlingen, Switzerland, 13 Nov 1978.
U.S. Sales Only.

The homogeneization of a uniform latt is a rather well understood topic while difficult problems arise if the lattice becomes irregular. The SPH homogeneization method is an attempt to generate homogeneized cross sections for an irregular lattice. The treatment of an isolated cylindrical cell with an entering surface current (in one velocity theory) is described. The extension of the SPH method to assembly problems is presented. The generalisation to general multigroup problems is included. Numerical results are obtained for a PWR rod bundle assembly. (Atomindex citation 11:500275)

LA-7170-MS-Sup.) PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Experimental Criticality Specifications, Update Through 1979. Informal Report.
H. C. Paxton. Feb 80, 7p
Contract W-7405-ENG-36

A table of contents for LA-7170-MS is provided, and publications of criticality specifications that appeared in 1978 and 1979 are listed. The table was omitted from the original document. An abstract of the original report appeared in Energy Research Abstracts, Volume 3: 43410. (ERA citation 05:019207)

LA-8057-PR PC **A04**/MF **A01**
Los Alamos Scientific Lab., NM.
Transport and Reactor Theory. Progress Report, April 1-June 30, 1979.
D. J. Dudziak, R. D. O'Dell, and R. E. Alcouffe. Oct 79, 63p
Contract W-7405-ENG-36

Research and development progress in transport and reactor theory by the Los Alamos Scientific Laboratory's Group T-1 for the third quarter of FY 79 is reported. Included are tasks in the areas of Transport Methods Supporting Research, Reactor Safety Analysis, Fusion Reactor Nucleonics, Shielding Methods, Safeguards Analysis, and Fission Reactor Neutronics. (ERA citation 05:004508)

18M. Reactors (Non-Power)

KFKI-1979-07 PC **A02**/MF **A01**
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
Real Time Program for Reactivity Calculations in Nuclear Reactors.
J. S. Janosy, and E. Vegh. Mar 79, 14p
In French.
U.S. Sales Only.

A computer control system was developed for a 5 MW research reactor. The system applies an R-10 process computer, which is the Hungarian equivalent of the French-made MITRA-15. The report describes a program of this system which determines the reactivity periodically once in a second. The list of the program is also presented in the Appendix. (Atomindex citation 10:473765)

18N. Snap Technology

DE81027473 PC **A03**/MF **A01**
AiResearch Mfg. Co. of Arizona, Phoenix.
Executive Summary: Brayton Isotope Power System.
15 Mar 78, 34p DOE/SF/01123-T57
Contract AC03-76SF01123

The status and program plans for the DOE program to design and develop a long-life, safe Brayton isotope power system for space power are described. (ERA citation 06:034412)

19.
ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-A107 037/4 PC **A03**/MF **A01**
Army Armament Research and Development Command, Aberdeen Proving Ground, MD. Ballistic Research Lab.
Effectiveness Testing for Antipropagation Shields Developed for M456 Heat Tank Ammunition.
Final rept.,
Jerry Thomas, and Philip M. Howe. Sep 81, 48p
Rept no. ARBRL-TR-02370

Numerous previous tests demonstrated the effectiveness of polyethylene bars emplaced between rounds of M456 HEAT tank ammunition to prevent a second round detonation given the detonation of a first round. However, these tests had a considerable margin of safety and the reliability and associated confidence level were unknown. In this report, a description is given of the statistical design and tests which were performed to establish the shielding thickness needed to be 90% confident that the probability of a second round detonating, given a first round detonation, was less than 0.1. (Author)

AD-A107 288/3 PC **A07**/MF **A01**
Army Armament Research and Development Command, Aberdeen Proving Ground, MD. Ballistic Research Lab.
Quantum-Mechanical Studies on Chemical Reactivity and Ballistic Chemistry. VII. Semiempirical Molecular Orbital Calculations and Experimental Studies on Relative Chemical Reactivities of Isomeric Tetrazole Derivatives, and their Relationship to the Explosive Properties of some Tetrazole Derivatives.
Technical rept.,
Michael A. Schroeder, and Ronald A. Henry. Oct 81, 136p Rept no. ARBRL-TR-02371
See also Volume 6, AD-A018 652.

A number of observations in the literature indicate that the reactivity of side-chain substituents on tetrazoles (and other azoles as well) depends strikingly on whether the trivalent (pyrrole-type) nitrogen atom is located at the 1- or the 2- position of the tetrazole ring; this dependence has been observed in decarboxylation, hydrogen exchange, diazotization, nucleophilic substitution and other reactions. To understand these differences, physical measurements have been carried out on a number of tetrazole derivatives. 1H, 19F and 13C NMR studies, as well as dissociation constant measurements, have been carried out on a variety of isomeric pairs of tetrazole derivatives.

AD-A107 311/3 PC **A02**/MF **A01**
Army Test and Evaluation Command, Aberdeen Proving Ground, MD.
Ammunition Characteristics.
Final rept. on test operations procedure.
9 Nov 81, 13p Rept no. TOP-4-2-500
Supersedes report dated 23 feb 67, AD-718 725.

This report describes procedures for collecting physical characteristics of ammunition and its components.

AD-A107 334/5 PC **A05**/MF **A01**
Army Armament Research and Development Command, Aberdeen Proving Ground, MD. Ballistic Research Lab.
A General Curvilinear Grid Generation Program for Projectile Configurations.
Final rept.,
J. L. Steger, C. J. Nietubicz, and K. R. Heavey. Oct 81, 82p Rept no. ARBRL-MR-03142

A planar grid generation routine has been developed for use with standard and non-conventional projectile shapes. Three-dimensional grid generation has been obtained by generating a sequence of planar grids about axis normal cross-sections. The method is basically automatic and generates smoothly varying grids for arbitrary body shapes and allows for grid point clustering. The program is modular and can be used to generate planar Cartesian-like grids, C-grids, O-grids, or any portion thereof. The routine can be used for axisymmetric projectiles with or without stings, symmetric tubular projectiles and for any configuration with an axisymmetric nose. Sample grids are presented along with the program listing and sample output. (Author)

LA-8082 PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Response of Containment Vessels to Explosive Blast Loading.
R. R. Karpp, T. A. Duffey, and T. R. Neal. Jun 80, 31p
Contract W-7405-ENG-36

The response of steel containment vessels to the blast loading produced by the detonation of high explosives is investigated by experiments, computations, and analysis. The vessels are thin-wall shell structures that are nearly spherical. All explosive charges are solid spheres, centrally initiated and centrally positioned within the vessels. Most of the work concerns vessels that contain, in addition to the explosive charge, air at ambient or reduced pressures. A scaling law that relates the first maximum strain occurring in the vessel wall to other relevant parameters is derived and shown to correlate the experimental data. One-dimensional, Lagrangian, finite-difference calculations are used to study the blast phenomenon and the details of the loading pulse applied to the vessel wall. The results are verified by comparisons with pressure gauge records. In addition, vessel response to the pressure loading is calculated by both finite-difference and finite-element computer codes. The two-dimensional motion, which occurs after significant wave interactions have taken place in the test vessels, can be simulated, with reasonable accuracy, by finite-element calculations. This result indicates that a predictive technique and, therefore, a design tool appear to be available with these standard calculational methods. The effects of a surrounding medium upon the peak strains occurring in a perfectly spherical vessel also are studied, and the reductions in strain caused by the inclusion of various surrounding media are estimated. (ERA citation 05:032749)

MHSMP-80-20 PC **A03**/MF **A01**
Mason and Hanger-Silas Mason Co., Inc., Amarillo, TX.
Tool Force Evaluation of Lathe Machined High Explosives.
G. L. Flowers. Apr 80, 44p
Contract AC04-76DP00487

The purpose of this study was to develop a better understanding of the effects of machining properties upon tool forces encountered during lathe machining of high explosives, in order to optimize machining conditions for mechanical properties test specimens. Monetary considerations dictated that the tooling either already exist or be fabricated in-house using limited machine shop capability. The design chosen which fit between the tool holder and the tool post and interfaced to existing signal conditioners was easily fabricated. The study evaluated all forces on the cutter during machining of two types of high explosives at four cutter radii, four feed rates, three depths of cut and two cutting speeds. The study pointed out design problems, instrumentation drift, tool chatter and detection levels. It also showed that the type of high explosive was more significant than first thought toward influencing tool force levels. (ERA citation 05:027658)

MLM-2664 PC **A02**/MF **A01**
Mound Facility, Miamisburg, OH.
Aluminum Particle Surface Studies in Al/Cu sub 2 O by Electron Spectroscopy for Chemical Analysis and Auger Electron Spectroscopy.
P. S. Wang, L. D. Haws, W. E. Modderman, and A. Rengan. 9 Nov 79, 25p
Contract EY-76-C-04-0053

Surface chemistry of Al/Cu sub 2 O thermite powders and pressed pellets undergoing accelerated aging was studied by x-ray photelectron spectroscopy (XPS) and Auger electron spectroscopy (AES). Al 1s, Cu 2P/sub 1/2/, Cu 2P/sub 3/2/, Cu L sub 3 -M sub 4 sub 5 M sub 4 sub 5 , O 1S, Al K-L sub 2 sub 3 , L sub 23 , C 1S, and Cu 3S signals were observed. The Al sub 2 O sub 3 film thicknesses on aluminum metal surfaces were deduced from signal intensity ratios of Al exp +3 and aluminum in XPS Al 2S as well as Al K-L sub 2 sub 3 L sub 2 sub 3 AES. The oxide thickness on the aluminum powder from the manufacturer was found to be 9A. Mixing of aluminum and Cu sub 2 O at room temperature to form thermite induced a certain degree of oxidation of the aluminum and increased the oxide film thickness to 11A. Hot pressing of thermite powders at 425 exp 0 C to from pellets increased the oxide layer to 22A. This oxide layer protected the aluminum fuel; further aging of these pellets at 180 exp 0 C for several months caused negligible change on the surface oxide. The bulk of the pellet was found to be stable and of good quality. (ERA citation 05:007562)

PATENT-4 256 038
Not available NTIS
Department of Energy, Washington, DC.
Perfluorocarbon Vapor Tagging of Blasting Cap Detonators.
Patent,
R. N. Dietz, and G. I. Senum. Filed 6 Feb 79, patented 17 Mar 81, 7p PAT-APPL-6-009 623
Supersedes PAT-APPL-6-009 623.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

A plug for a blasting cap is made of an elastomer in which is dissolved a perfluorocarbon. The perfluorocarbon is released as a vapor into the ambient over a long period of time to serve as a detectable taggant. (ERA citation 06:037417)

19C. Combat Vehicles

AD-A106 972/3 PC **A05**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
Proceedings of the International Society for Terrain-Vehicle Systems Workshop on Snow Traction Mechanics, Alta, Utah, 29 January-2 February 1979.
Special rept.,
William L. Harrison. Jul 81, 77p Rept no. CRREL-SR-81-16

This report reviews the state of the art of snow traction mechanics and presents the results of a limited field exercise that allowed participants to observe and practice current snow measurement processes and vehicle test procedures. The prime recommendations of the workshop attendees were the use of parameters basic to the laws of physics for the classification of snow strength, and the use of instrumented tracked and wheeled vehicles for snow strength measurements. (Author)

AD-A107 066/3 PC **A02**/MF **A01**
Army Field Artillery School, Fort Sill, OK.
Independent Evaluation Plan for Crew Ballistic Shelter for the M110A2. Revision.
18 Aug 81, 15p
Revision of report dated Dec 79.

The results of Legal Mix V showed that the survivability of the M110 system could be significantly enhanced through the addition of ballistic protection to the M110 and its associated Ammunition Resupply Vehicle. The Crew Ballistic Shelter consists of a removable armored cab fastened to the vehicle turret. It is similar in shape and appearance to the present winterization kit. Sight openings and doors in the front and sides of the shelter provide for fire control sighting operations. An M8 NBC Collective Protection System is also included. The Ballistic Shelter will enhance the Field Artillery's support of maneuver forces by significantly improving survivability of the on-board crew against hostile artillery fire. The shelter will remain installed on the weapon for all normal operations, e.g., road march, firing, etc. The shelter can be removed by the organic howitzer crew with the aid of the organizational maintenance wrecker, when necessary, to facilitate maintenance or transportability. Both the howitzer and shelter can be transported on one flat car.

19D. Explosions, Ballistics, and Armor

AD-A106 822/0 PC **A03**/MF **A01**
Naval Weapons Center, China Lake, CA.
How to Make TIGER Perform: A Supplementary Operator's Manual for the TIGER Code.
Technical memo.,
Edward P. Petkus, and Kenneth J. Graham. Sep 81, 38p Rept no. NWC-TM-4650

TIGER is a digital computer code written in FORTRAN IV for calculating the thermodynamic state of a nonideal heterogeneous system of known composition. It was developed at Stanford Research Institute specifically for detonation calculations after experience with the RUBY code at Lawrence Livermore Laboratory and the BKW code at Los Alamos Scientific Laboratory had led to the conclusion that a more versatile code was required to perform routine and research calculations on condensed explosives. While RUBY is limited by its inability to treat certain explosive compositions, both RUBY and BKW are restricted by the inflexibility of their interlocking subroutines which, for example, prevent use of a new equation of state in a calculation without complete reprogramming. The TIGER code was constructed to avoid the problems associated with interdependent subroutines. The program was written in modular form so that the thermodynamics used to calculate the state, the hydrodynamics used to calculate detonation parameters, and the equations of state used to describe the properties of the system are treated separately in different parts of the code. Because of this separation, TIGER can be best described as a general code for calculating the thermodynamic properties of a nonideal heterogeneous mixture (described by an arbitrary equation of state), with the capability of calculating detonation parameters provided by the hydrodynamic option. (Author)

AD-A107 081/2 PC **A05**/MF **A01**
Naval Surface Weapons Center, Dahlgren, VA.
Use of Foam to Reduce Gun Blast Noise Levels.
Final rept.,
L. L. Pater, and J. W. Shea. Mar 81, 81p Rept no. NSWC/TR-81-94

It was conclusively demonstrated that aqueous foam can effect significant (greater than 10 dB) reductions in gun muzzle blast peak sound pressure level. Reductions of more than 10 dB were attained. In addition, muzzle flash was eliminated completely. Containment of the foam in a muzzle-mounted canister appears to offer a feasible and operationally acceptable method of exploiting the phenomenon. (Author)

AD-A107 319/6 PC **A04**/MF **A01**
Army Armament Research and Development Command, Aberdeen Proving Ground, MD. Ballistic Research Lab.
Shock Tube Tests of Muzzle Blast Transducers.
Final rept.,
Edmund J. Gion, and George A. Coulter. Sep 81, 62p ARBRL-MR-03141, AD-E430 701
Supersedes ARBRL-IMR-691.

A fairly extensive comparison testing of blast transducers is presented. A number of blast transducers were exposed to a series of shock waves from the BRL 58 cm shock tube. Both the angle of shock incidence and the incident pressure levels were varied during the tests. The purpose of the study was to check the transducer's response and accuracy when misaligned to the flow direction. The complete sets of pressure-time records for representative transducer types are presented. The results show that, in general, none of the tested blast transducers measures the static or side-on pressures accurately independent of orientation. As a consequence, continual attention must be given to optimal transducer orientation and other considerations relevant to the blast transducer used.

AD-A107 446/7 PC **A02**/MF **A01**
National Research Council, Washington, DC. Commission on Human Resources.
Model of Direct Initiation of Unconfined Detonations.
Contractor rept. Jan-Feb 81,
S. Eidelman. Mar 81, 25p NPS-67-81-02CR
Contract N00228-79-C-A414

An analytical model of the direct initiation of detonation waves with planar, cylindrical, and spherical symmetry is developed. This model shows that the energy requirements for the self-sustained detonation wave differ significantly for planar, cylindrical and spherical detonations. The new concept of minimum compensation energy was introduced and the technique of calculation of minimum initiation energy was developed. The results are verified by numerical simulation of the full governing equations and by comparison to experimental data. (Author)

19E. Fire Control and Bombing Systems

AD-A106 897/2 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Mission Analysis and Acquisition Div.
Evaluation of the Army's Advanced Field Artillery Tactical Data System.
15 Sep 81, 17p Rept no. GAO/MASAD-81-44

The specific objectives of our evaluation were to (1) identify and assess the Army's decision to acquire AFATDS, (2) assess the extent of competition planned for the AFATDS program, and (3) analyze the MIFASS architecture and identify those components and features that could be candidates for incorporation into AFATDS. Information on the scope, methodology, and limitations of our evaluation is in the enclosure.

AD-A107 481/4 PC **A09**/MF **A01**
Army Project Manager for Training Devices, Orlando, FL.
Simulated Tank Anti-Armor Gunnery System (STAGS).
Interim rept.,
Albert Marshall, Bon Shaw, Herbert Towle, George Siragusa, and Gary Bond. Nov 81, 194p Rept no. PM TRADE-RE-0010

This report describes a missile flight simulator research model developed to train DRAGON gunners. It is also being adapted to a variety of similar antiarmor weapons. The system employs a terrain board with enemy armored vehicles moving in a variety of attack scenarios. When the gunner fires the missile, hears computer generated rocket sounds and experiences the weight loss, recoil and smoke of the missile launch. When the smoke clears, he views the missile in the sight as well as the target. The gunner's aiming error is measured using a micro-processor-controlled diode matrix array. The matrix detector senses an IR emitting diode which is located on the miniature target. The flight equations of motion for the missile are solved by a 16 bit microprocessor every 0.02 seconds in each axis using gunner aiming error, target position, gravity, drag and side thruster accelerations as inputs. A second coordinated 16 bit processor controls a display that plots both vertical and horizontal aiming error for analysis of the gunner's performance by an instructor. Experienced DRAGON gunners have tested the system and attested to the realism and training potential. (Author)

19F. Guns

AD-A106 821/2 PC **A03**/MF **A01**
Army Armament Research and Development Command, Dover, NJ. Technical Support Directorate.
Simulation Testing of Weapon Systems.
Final rept.,
Robert J. Radkiewicz. Oct 81, 26p ARTSD-TR-81001, AD-E400 720

The testing of Army weapon systems can be significantly improved through initial use of physical simulation testing. This report discusses two simulators that are available for testing weapons and weapon systems under conditions encountered during their life cycle. The one-degree-of-freedom (1-DOF) simulator provides a variable mounting platform from which weapons can be test fired to assess the effect of the mounting conditions on operability. Sections of vehicles to which weapons are mounted are suspended from the six-degree-of-freedom (6-DOF) simulator, which imparts various vibratory types of motions to the mounted vehicle and weapons fired under these realistic conditions. The report includes a discussion of the data acquisition system which provides immediate analysis of the data obtained from simulation testing. (Author)

AD-A107 310/5 PC **A02**/MF **A01**
Army Test and Evaluation Command, Aberdeen Proving Ground, MD.
Weapon Characteristics.
Final rept. on test operations procedure.
9 Nov 81, 11p Rept no. TOP-3-2-500
Supersedes report dated 5 Jun 71, AD-726 909.

This report describes procedures for uniform collection of physical characteristics of guns and howitzers, mortars, small arms, recoilless rifles, and small rocket launchers. (Author)

AD-A107 312/1 PC **A03**/MF **A01**
Army Armament Research and Development Command, Aberdeen Proving Ground, MD. Ballistic Research Lab.
Secondary Combustion in Gun Exhaust Flows.
Final rept.,
Edward M. Schmidt. Oct 81, 37p Rept no. ARBRL-TR-02373

The muzzle flash from cannon is analyzed using a simple description of the gun exhaust plume flow structure coupled to an empirical ignition criteria. The effect of muzzle devices such as recoil brakes is estimated through an approximate description of their internal flow. The influence of the transient nature of the weapon exhaust plume is examined by using a one-dimensional, unsteady numerical model to develop the flow properties along the axis of symmetry. These properties are input into the ignition model and the possibility of the occurrence of secondary combustion is determined as a function of time during gun tube emptying. (Author)

AD-A107 314/7 PC **A03**/MF **A01**
GMAF, Inc., Freeport, NY.
Muzzle Flow in the Presence of an Anti-Recoil Plate: Exploratory Study.
Final rept.,
Gino Moretti, and Michael T. Di Piano. Oct 81, 33p TM-81/1, ARBRL-CR-00471
Contract DAAK11-80-Q-0124

Numerical analysis is attempted on the gasdynamics associated with flow over an anti-recoil plate. The blast field is analyzed under the assumptions that the presence of the precursor flow and projectile may be neglected. An existing shock-fitting code is used in order to determine its capability when computing impingement flowfields. While the code provided good prediction of the exhaust flow from the muzzle of the gun up until shock impingement, problems were encountered in treating the flow following this event. It is clearly demonstrated that a major reshaping of the code has to be undertaken in order to provide efficient computational grids. (Author)

19G. Rockets

AD-A107 371/7 PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Limiting Payload Deceleration during Ground Impact,
Alan Mironer, Robert Urquhart, and Roy Walters.
1981, 8p Rept no. AFGL-TR-81-0320
Presented at the AIAA Aerodynamic Decelerator and Ballroom Technology Conference (7th) as Paper no. 81-1918 on 20-23 Oct 81 at San Diego, CA.

This paper considers the problem of limiting the deceleration of balloon and sounding-rocket instrument payloads during ground impact by adding energy-dissipating, deformable structures. The basic physics of the two-step deceleration/energy-dissipation process is analyzed and simple force and energy balance relationships are developed. The pertinent equations are organized in a form that is conducive for computer computation.. Two example problems, one of a sounding-rocket payload and the other of a balloon payload are calculated and the results presented in the form of a performance map. (Author)

19H. Underwater Ordnance

AD-A106 896/4 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Mission Analysis and Acquisition Div.
The British Sting Ray Torpedo: Information Should be Obtained to Determine Potential Benefits to U.S. Antisubmarine Warfare Programs.
14 Sep 81, 5p Rept no. GAO/MASAD-81-43

Under the Department of Defense (DOD) Major Weapon Systems Acquisition Policy, all available system alternatives--including foreign options--are to be considered at major decision milestones. At milestone I of the acquisition process, one or more alternatives are selected for competitive demonstration and validation. In preparation for ALWT's milestone I, in July 1979 the Navy reviewed the Sting Ray as an alternative to the proposed ALWT. The Sting Ray was rejected after the Navy analyzed available operational requirements data and concluded that its performance goals would not meet ALWT requirements. This remains the official U.S. Navy position.

20. PHYSICS

20A. Acoustics

AD-A107 026/7 PC **A02**/MF **A01**
Hawaii Inst. of Geophysics, Honolulu.
Compressional-Shear Wave Coupling Induced by Velocity Gradients in Marine Sediments,
Gerard J. Fryer. 12 May 80, 16p Rept no. HIG-CONTRIB-1096
Contract N00014-75-C-0209
Pub. in Jnl. of the Acoustical Society of America, v69 n3 p647-660 Mar 81.

No abstract available.

AD-A107 060/6 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Electromagnetic Long-Line Effects in Surface Wave Convolvers.
Journal article,
Eric L. Adler. 1980, 7p MS-5433, ESD-TR-81-242
Contract F19628-80-C-0002
Pub. in 1980 Ultrasonics Symposium Proceedings, p82-87 Nov 80.

No abstract available.

AD-A107 169/5 PC **A13**/MF **A01**
Texas Univ. at Austin. Applied Research Labs.
Covariance Functions and Related Statistical Properties of Acoustic Backscattering from a Randomly Rough Air-Water Interface.
Technical rept.,
Gary R. Wilson. 19 Jun 81, 298p Rept no. ARL-TR-81-23
Contract N00014-80-C-0490

An experimental and theoretical study of the scattering of sound from the surface of a freshwater lake was performed. The study was limited to backscattered sound (reverberation) from a pulsed sound source. The experimental study employed nine vertically separated receivers and four horizontally separated receivers in order to examine the spatial and temporal covariance of the backscattered sound for both orientations simultaneously. Approximately 1000 narrowband reverberation returns were generated by repetitively projecting a 100 microsec CW pulse centered at 80kHz at the wind-roughened surface of a freshwater lake at a 10.5 degree grazing angle. The returns were sampled digitally for a 10 msec interval during which surface reverberation was predominant, and were formed into ensembles at each sample time. Significant differences were observed between the covariances of the vertical and horizontal arrays. The envelope of the covariance between the vertical receivers maintained a significant level at much larger separations than the horizontal receivers. The phase of the vertical covariance was found to change linearily with time, resulting in a slow oscillation of the covariance with time, while the phase of the horizontal covariance was constant (and non-zero). The vertical covariance was also shown to depend on the location of the elements on the array.

AD-A107 216/4 PC **A02**/MF **A01**
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Mathematical Sciences.
Refracted Ray Characteristics from the Geometrical Spreading Equation for Depth-Dependent Media,
W. L. Siegmann, M. J. Jacobson, and J. G. Watson. 6 Nov 80, 15p Rept no. RPI-MATH-131
Contract N00014-76-C-0288
Pub. in Jnl. of Acoustical Society of America, v70 n2 p583-590 Aug 81.

No abstract available.

N82-11858/9 PC**$7.50**/MF**$3.00**
Bionetics Corp., Hampton, VA.
Handbook for Industrial Noise Control.
1981, 139p NASA-SP-5108
Contract NAS1-15721

The basic principles of sound, measuring techniques, and instrumentation associated with general purpose noise control are discussed. Means for identifying and characterizing a noise problem so that subsequent work may provide the most efficient and cost effective solution are outlined. A methodology for choosing appropriate noise control materials and the proper implementation of control procedures is detailed. The most significant NASA sponsored contributions to the state of the art development of optimum noise control technologies are described including cases in which aeroacoustics and related research have shed some light on ways of reducing noise generation at its source.

20B. Crystallography

AD-A107 013/5 Not available NTIS
Northwestern Univ., Evanston, IL. Dept. of Materials Science.
X-Ray Diffraction Study of Zr(Ca, Y)O sub 2-x; The Disordered State,
J. B. Cohen, M. Morinaga, and J. Faber, Jr. 1981, 4p ARO-16740.6-MS
Contract DAAG29-80-C-0035, Grant DAAG29-76-G-0303
Availability: Pub. in Solid State Ionics v3 n4 p61-63 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 051/5 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Liquid-Encapsulated Czochralski Growth of InP Crystals.
Journal article,
Gerald W. Iseler. 1981, 6p JA-5175, ESD-TR-81-263
Contract F19628-80-C-0002
Pub. in Jnl. of Crystal Growth, v54 p16-20 1981.

No abstract available.

AD-A107 053/1 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Vapor-Phase Epitaxy of GaInAsP and InP.
Journal article,
Paul Vohl. 1981, 9p JA-5176, ESD-TR-81-264
Contract F19628-80-C-0002
Pub. in Jnl. of Crystal Growth, v54 p101-108 1981.

No abstract available.

AD-A107 054/9 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Liquid Phase Epitaxial Growth of Hg(1-x)Cd(x)Te from Te-Rich Solutions.
Journal article,
Theodore C. Harman. 1981, 9p JA-MS-5678, ESD-TR-81-248
Contract F19628-80-C-0002
Pub. in SPIE V285 Infrared Detector Materials p84-91 1981.

No abstract available.

AD-A107 157/0 Not available NTIS
IBM Thomas J. Watson Research Center, Yorktown Heights, NY.
Molecular Beam Epitaxy of Ge-GaAs Superlattices,
C. A. Chang, W. K. Chu, E. E. Mendez, L. L. Chang, and L. Esaki. 18 Feb 81, 5p ARO-15229.24-P
Contract DAAG29-78-C-0007
Availability: Pub. in Jnl. of Vacuum Science and Technology, v19 n3 p567-570 Sep/Oct 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 170/3 PC **A02**/MF **A01**
Lehigh Univ., Bethlehem, PA. Dept. of Physics.
Radiation Damage Processes in Silicon,
George D. Watkins. 1981, 2p
Contract N00014-76-C-1097

The basic objective is to understand the electronic properties of simple point lattice defects in the silicon lattice, the mechanisms by which they are formed, and the processes by which they can migrate through the lattice and react with other defects to form complexes.

AD-A107 233/9 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Liquid-Phase Epitaxial Growth of InP and InGaAsP Alloys.
Journal article,
Steven H. Groves, and Muriel C. Plonko. 1981, 8p JA-5174, ESD-TR-81-262
Contract F19628-80-C-0002
Pub. in Jnl. of Crystal Growth, v54 p81-87 1981.

No abstract available.

AD-A107 332/9 PC **A02**/MF **A01**
Maine Univ., Orono. Dept. of Physics.
On the Accuracy of Low-Energy Electron Diffraction.
Technical rept.,
W. N. Unertl. 20 Aug 79, 4p Rept no. TR-3
Contract N00014-79-C-0441
Pub. in Jnl. of Vacuum and Science Technology, v17 n1 p186-187 Jan/Feb 80.

No abstract available.

AD-A107 395/6 PC **A06**/MF **A01**
Westinghouse Research and Development Center, Pittsburgh, PA.
Preparation of Large-Diameter GaAs Crystals.
Annual rept. no. 1, Jun 80-Jun 81,
H. M. Hobgood, T. T. Braggins, D. L. Barrett, G. W. Eldridge, and R. N. Thomas. 18 Sep 81, 125p Rept no. 81-9F7-BOULE-R5
Contract N00014-80-C-0445

Significant progress has been made toward developing large-diameter, semi-insulating GaAs crystals of improved quality by LEC growth for direct ion implantation. The intent has been to (1) develop a reproducible twin-free growth technique for large-diameter 50-mm and 75-mm GaAs crystals; (2) achieve stable, semi-insulating substrate properties without resorting to intentional doping with chromium (or at least to reduce the Cr content significantly) to avoid the serious redistribution problems associated with this impurity; (3) obtain uniform, predictable doping characteristics by direct 29Si implantation; and (4) demonstrate that uniform, round cross-section slices suitable for low-cost IC processing can be fabricated from LEC crystals.

DE82000655 PC **A02**/MF **A01**
Cornell Univ., Ithaca, NY.
Point-Defect Sources and Sinks.
D. N. Seidman. Aug 81, 9p DOE/ER/03158-98
Contract AS02-76ER03158

The role played by sources and sinks of point defects is of importance in understanding a wide range of physical phenomena. The problem of the efficiency (eta) of a sink (or sources) and its relationship to the super (or sub) saturation of point defects which drives the process is considered. A qualitative discussion is given of the atomic mechanisms by which the following defects act as sources and sinks: (a) the free surface; (b) voids; (c) dislocation loops; and (d) grain boundaries. Examples of specific values of eta are given for

different experimental situations. (ERA citation 06:035663)

N82-11958/7 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Materials Science and Engineering.
Growth of Solid Solution Single Crystals.
Final Report.
A. F. Witt. Oct 81, 12p NASA-CR-161891
Contract NAS8-32994

The bulk growth of HgCdTe crystals by modified Bridgman techniques and by quenching anneal recrystallization yields deficient material. The primary complication for growth arises from a pronounced tendency for constitutional supercooling caused by the characteristics of the phase diagram and from the high vapor pressure of Hg. Unseeded and seeded Bridgman growth are considered from the viewpoints of: (1) backmelting of a solid charge; (2) equilibration prior to regrowth; and (3) the growth process. A growth system developed to restrict the thermal gradient region in the melt is described which is based on differentially operated heat pipes (isothermal regions) separated by an (adiabatic) gradient region, this permits maximized radial thermal gradient control, which is desirable for the establishment of a planar solidification isotherm.

PB82-133935 Not available NTIS
National Bureau of Standards, Washington, DC.
Comparison of Profile and Integrated-Intensity Methods in Powder Refinement.
Final rept.,
E. Prince. 1981, 3p
Pub. in Jnl. of Applied Crystallography 14, p157-159 1981.

If a powder pattern consists of well resolved peaks, and if it is adequately described by a crystallographic model, as determined by statistical tests, the estimates of the parameters and their standard deviations will not be significantly different, in a statistical sense, whether the method of refinement uses peak profiles or integrated intensities. If the model does not fit adequately, the standard deviations cannot be calculated by statistical methods. If peaks overlap, there are correlations between the intensities of the individual peaks that are handled automatically in the profile method, but must be included explicitly in the integrated-intensity method. A background function should be included in the model, and its parameters refined. The background parameters have correlations with other parameters that become important if the pattern is complex, and therefore poorly resolved.

20C. Electricity and Magnetism

AD-A107 243/8 PC **A03**/MF **A01**
Army Mobility Equipment Research and Development Command, Fort Belvoir, VA.
Fundamentals of Ion Motion in Electric Radiofrequency Multipole Fields.
Final rept. for period ending Apr 81,
M. H. Friedman, A. L. Yergey, J. E. Campana, and L. Kelner. Jul 81, 42p Rept no. MERADCOM-2332

The fundamentals of ion motion in electromagnetic fields are reviewed in detail with a special emphasis on electric radiofrequency (RF) fields which are used frequently in dynamic mass spectrometry. Forces and effects on ions in electromagnetic fields which are typically neglected, but which may be important in practical applications, are reviewed and discussed for completeness. A method based on complex variable theory is developed for finding the potential function of 'ideal multiplole electromagnetic fields.' Application of this method for the determination of potential functions and differential equations of ion motion is demonstrated with reference to the electric radiofrequeny dipole, quadrupole, hexapole, octapole, and decapole fields. The results and implications of this preliminary communication and tutorial are of importance in ion physics and dynamic mass spectrometry. (Author)

AD-A107 278/4 PC **A02**/MF **A01**
Panametrics, Inc., Waltham, MA.
Theoretical Investigation of Absorptive Processes.
Final rept. 1 Apr 79-1 Apr 81,
Norman E. Pedersen, Jeanne C. Pedersen, and Peter C. Waterman. May 81, 10p PANA-04, ARO-16608.1-P
Contract DAAG29-79-C-0053

With the ultimate goal of developing computer codes for obtaining the transmission and reflection properties of conductive particle clouds, progress is described in both the computation of electromagnetic cross sections of conductive fibers, and the radiative transfer effects governing the behavior of clouds of such fibers. (Author)

PB82-134164 PC **A03**/MF **A01**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
COMPUMAG: Papers Presented by Members of the Laboratory at the Conference of the Computation of Electromagnetic Field, Chicago, 14-17 September, 1981,
A. G. A. M. Armstrong, C. S. Biddlecombe, N. J. Diserens, M. W. Fan, and E. A. Heighway. c1981, 39p RL-81-076

Contents: The PE2D package for transient eddy current analysis; Automated optimization of magnet design using the boundary integral method; Three dimensional eddy current computations; A space charge beam option for the PE2D and TOSCA packages; Two dimensional automatic triangular mesh generation for the finite element electromagnetics package PE2D; A comparison of integral and differential equation solutions for field problems.

20D. Fluid Mechanics

AD-A106 968/1 PC **A02**/MF **A01**
Royal Aircraft Establishment, Farnborough (England).
The Design of a 'Jet Catcher'.
Technical memo.,
K. G. Winter, and L. F. East. Feb 81, 12p RAE-TM-AERO-1891, DRIC-BR-78582

The basic principles of a device for catching and dissipating the kinetic energy of a jet are described and a design of a particular form of the jet catcher outlined. This has been in use for some time as part of the RAE Boundary Layer Tunnel and has proved completely successful in eliminating unwanted air currents in the test room of the tunnel. The device should have wide applications in industry in general and in aeronautics in particular in situations where high energy jets may be a source of nuisance or even of danger. It has been patented under British Patent Specification 1490188. (Author)

AD-A106 993/9 PC **A04**/MF **A01**
Brown Univ., Providence, RI. Div. of Engineering.
A Study of the Interactions between Large-Scale Coherent Structures and Fine-Grained Turbulence in a Round Jet,
R. Mankbadi, and J. T. C. Liu. 12 Jul 79, 67p
Contract N00014-76-C-0363, Grant NSF-ENG76-24585
Pub. in Philosophical Transactions of The Royal Society of London, v298 n1443 p541-602, 21 Jan 81. Sponsored in part by Grant NSF-CME78-22127.

No abstract available.

AD-A107 010/1 Not available NTIS
California Inst. of Tech., Pasadena.
The Von Karman Swirling Flows,
Marianela Lentini, and Herbert B. Keller. 12 Dec 78, 15p ARO-15622.5-M
Contracts DAAG29-78-C-0011, EY-76-S-03-0767
Availability: Pub. in SIAM Jnl. of Applied Mathematics, v38 n1 p52-64 Feb 80 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 210/7 PC **A03**/MF **A01**
Brown Univ., Providence, RI. Div. of Engineering.
Interactions between Large-Scale Coherent Structures and Fine-Grained Turbulence in Free Shear Flows,
J. T. C. Liu. 1981, 48p
Contract N00014-76-C-0363, Grant NSF-CME78-22127
Pub. in Transition and Turbulence, p167-214 1981.

No abstract available.

AD-A107 211/5 PC **A02**/MF **A01**
Brown Univ., Providence, RI. Div. of Engineering.
Instability and Transition in Pipes and Channels,
J. T. Stuart. 1981, 11p
Contract N00014-76-C-0363, Grant NSF-ME78-22127
Pub. in Transition and Turbulence, p77-94 1981.

No abstract available.

AD-A107 267/7 PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
High Solitary Waves in Water: Results of Calculations,
James M. Witting. 30 Sep 81, 20p Rept no. NRL-8505

This report presents results of calculations of certain properties of solitary waves in water as a function of wave strength, with emphasis on the highest and other high waves. A preceding report outlines the method used to arrive at the results presented here. The method involves a Fourier series solution of the flow field at various (numerical) resolutions to arrive at an estimate of limits as the resolution becomes infinitesimal. Values of the properties of intermediate and high waves possess 4 to 6 significant figure accuracies. For some solitary wave parameters, the calculations agree well with those found using independent methods and verify that the total energy and other integral properties reach a maximum at strengths less than that of the highest wave. They also verify that the maximum angle of surface inclination can exceed 30 deg. for the not-quite-highest waves. In addition, this report gives solitary wave properties useful in constructing periodic wave solutions by the superimposition of solitary waves. The highest wave in water is higher than previously reported; its amplitude to depth ratio is 0.8332. (Author)

DE82000267 PC **A06**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Diffusion of Gases in Capillaries.
N. S. Jacobson. Aug 81, 108p LBL-13227
Contract W-7405-ENG-48
Thesis.

Two aspects of the diffusion of gases in capillaries are explored. In Part I a Monte Carlo computer simulation of Knudsen flow is adapted to count collisions and record collision distributions. Using this simulation, the behavior of gases in both open and closed end tubes is examined. Given a tube with one end closed and a length-to-radius ratio of L/R, it is shown that a molecule that enters this tube will strike the wall an average of 2 L/R times before escaping. It is also shown that most molecules do not travel very far into the pore. However, those that reach the pore bottom usually strike the walls many times before escaping. The average number of collisions a molecule undergoes in passing through an open-end capillary is also calculated. If the reaction probability is already known, the processes in a supported catalyst can be simulated. From this analysis the distribution of active material, pore size, and pellet diameter can be optimized for a given reaction. Part II is an experimental study of Knudsen and surface diffusion in porous alumina. This material had pores 1.1 to 1.3 mu in diameter and was used as barriers 1.124 to .114 mm thick. It is shown that He, Ar, N sub 2 , O sub 2 , CO sub 2 , CH sub 4 , NH sub 3 , and SO sub 2 all pass through these barriers by Knudsen diffusion at room temperature. At 631 exp 0 K, zinc vapor also passes through this material by Knudsen flow. However, NaCl, NaF, and LiF vapors show substantial elements of surface diffusion with surface flux to Knudsen flux ratios of 1.6, 5.1, and 11.2, respectively. (ERA citation 06:035581)

LA-8129-MS PC **A09**/MF **A01**
Los Alamos Scientific Lab., NM.
CONCHAS: An Arbitary Lagrangian-Eulerian Computer Code for Multicomponent Chemically Reactive Fluid Flow at All Speeds.
T. D. Butler, L. D. Cloutman, J. K. Dukowicz, and J. D. Ramshaw. Nov 79, 197p
Contract W-7405-ENG-36

The CONCHAS computer code, which solves the equations of transient multicomponent chemically reactive fluid dynamics in two space dimensions is de-

scribed. CONCHAS is a time-marching finite-difference code that utilizes a partially implicit numerical scheme and a generalized mesh. Both planar and axisymmetric problems may be solved. Spatial differences are formed with respect to a two-dimensional mesh whose cells are arbitrary quadriaterals. The location of the cell corners, or vertices, may be arbitrarily specified as functions of time, thereby allowing a Lagrangian, Eulerian, or mixed description. This capability is particularly useful for representing curved and or moving boundary surfaces. Arbitrary numbers of species and chemical reactions are allowed. Discussions are given of the governing equations, the numerical scheme, and the code structure. A FORTRAN listing of the code is also provided. (ERA citation 05:012308)

N82-11032/1 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Some Observations on a New Numerical Method for Solving Navier-Stokes Equations.
A. Kumar. Nov 81, 19p NASA-TP-1934, L-14746

An explicit-implicit technique for solving Navier-Stokes equations is described which, is much less complex than other implicit methods. It is used to solve a complex, two-dimensional, steady-state, supersonic-flow problem. The computational efficiency of the method and the quality of the solution obtained from it at high Courant-Friedrich-Lewy (CFL) numbers are discussed. Modifications are discussed and certain observations are made about the method which may be helpful in using it successfully.

N82-11036/2 PC **A04**/MF **A01**
College of Aeronautics, Cranfield (England).
A Wake Source Model for Asymmetric Potential Flow past Bodies of Wedge Shape.
P. A. T. Christopher, and I. Wolton. Oct 81, 55p C-OF-A-MEMO-8112

The wake source model of Parkinson & Jandali was generalized in several ways to accommodate the lack of symmetry and the experimentally observed difference in base pressure at the points of flow separation. A basic indeterminacy is revealed which arises partly from the simple form of the model and partly from the Schwarz-Christoffel mapping employed. This indeterminacy is shown to be relatively unimportant in one symmetric case, but leaves open the more general case to further exploration. Application of the method to wedges having short and long afterbodies shows that, in the former case, the agreement between theory and experiment is substantially better than that for the long afterbody.

N82-11038/8 PC **A04**/MF **A01**
College of Aeronautics, Cranfield (England).
Generation of Axi-Symmetric Body Shapes in Subsonic Flow by Means of Polynomial Distributions of Sources and Doublets Along the Axis of Symmetry.
P. A. T. Christopher, and C. T. Shaw. Oct 81, 52p C-OF-A-MEMO-8110

A method is presented for determining the potential flow around bodies of revolution, at incidence, in uniform, incompressible, flow. This method utilizes polynomial distributions of both sources and doublets, and give considerable advantage over existing techniques. In particular, in a typical case, the computer storage requirement is reduced by a factor of eleven. Compared with panel methods the saving is very much greater. Both body surface and flow field conditions are obtainable and it would appear that the new method is ideally suited to the store trajectory application in place of the existing discrete source method.

N82-11046/1 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Computation of High Reynolds Number Internal/External Flows.
M. C. Cline, and R. G. Wilmoth. 1981, 12p NASA-TM-84049, DE81-025343
Contract W-7405-ENG-36
Presented at the 5TH Aiaa Computational Fluid Dyn. Conf., Palo Alto, Calif., 22-23 Jun. 1981.

A general, user oriented computer program, called VNAP2, was developed to calculate high Reynolds number, internal/ external flows. The VNAP2 program solves the two dimensional, time dependent Navier-Stokes equations. The turbulence is modeled with either a mixing-length, a one transport equation, or a two transport equation model. Interior grid points are computed using the explicit MacCormack Scheme with special procedures to speed up the calculation in the fine grid. All boundary conditions are calculated using a reference plane characteristic scheme with the viscous terms treated as source terms. Several internal, external, and internal/external flow calculations are presented.

N82-11393/7 PC **A07**/MF **A01**
Stanford Univ., CA. Thermosciences Div.
A Three-Dimensional Simulation of Transition and Early Turbulence in a Time-Developing Mixing Layer.
A. B. Cain, W. C. Reynolds, and J. H. Ferziger. Aug 81, 140p NASA-CR-164942, SU-TF-14
Contract NCC2-15

The physics of the transition and early turbulence regimes in the time developing mixing layer was investigated. The sensitivity of the mixing layer to the disturbance field of the initial condition is considered. The growth of the momentum thickness, the mean velocity profile, the turbulence kinetic energy, the Reynolds stresses, the anistropy tensor, and particle track pictures of computations are all examined in an effort to better understand the physics of these regimes. The amplitude, spectrum shape, and random phases of the initial disturbance field were varied. A scheme of generating discrete orthogonal function expansions on some nonuniform grids was developed. All cases address the early or near field of the mixing layer. The most significant result shows that the secondary instability of the mixing layer is produced by spanwise variations in the straining field of the primary vortex structures.

N82-11394/5 PC **A08**/MF **A01**
Stanford Univ., CA. Thermosciences Div.
Mixing of a Passive Scalar in Isotropic and Sheared Homogeneous Turbulence.
E. Shirani, J. H. Ferziger, and W. C. Reynolds. May 81, 175p NASA-CR-164938, SU-TF-15
Contracts NCC2-15, NSF ENG-78-17619

In order to calculate the velocity and scalar fields, the three dimensional, time-dependent equations of motion and the diffusion equation were solved numerically. The following cases were treated: isotropic, homogeneous turbulence with decay of a passive scalar; and homogeneous turbulent shear flow with a passive scalar whose mean varies linearly in the spanwise direction. The solutions were obtained at relatively low Reynolds numbers so that all of the turbulent scales could be resolved without modeling. Turbulent statistics such as integral length scales, Taylor microscales, Kolmogorov length scale, one- and two-point correlations of velocity-velocity and velocity-scalar, turbulent Prandtl/Schmidt number, r.m.s. values of velocities, the scalar quantity and pressure, skewness, decay rates, and decay exponents were calculated. The results are compared with the available expermental results, and good agreement is obtained.

N82-11395/2 PC **A08**/MF **A01**
Stanford Univ., CA. Thermosciences Div.
Higher-Level Simulations of Turbulent Flows.
J. H. Ferziger. Mar 81, 152p NASA-CR-164936, SU-TF-16
Contracts NGR-2-15, NCC2-15

The fundamentals of large eddy simulation are considered and the approaches to it are compared. Subgrid scale models and the development of models for the Reynolds-averaged equations are discussed as well as the use of full simulation in testing these models. Numerical methods used in simulating large eddies, the simulation of homogeneous flows, and results from full and large scale eddy simulations of such flows are examined. Free shear flows are considered with emphasis on the mixing layer and wake simulation. Wall-bounded flow (channel flow) and recent work on the boundary layer are also discussed. Applications of large eddy simulation and full simulation in meteorological and environmental contexts are included along with a look at the direction in which work is proceeding and what can be expected from higher-level simulation in the future.

N82-11396/0 PC **A09**/MF **A01**
Stanford Univ., CA. Thermosciences Div.
Numerical Simulation of a Compressible Homogeneous, Turbulent Shear Flow.
Ph.D. Thesis.
W. J. Feiereisen, W. C. Reynolds, and J. H. Ferziger. Mar 81, 195p NASA-CR-164953, SU-TF-13
Contract NCC2-15

A direct, low Reynolds number, numerical simulation was performed on a homogeneous turbulent shear flow. The full compressible Navier-Stokes equations were used in a simulation on the ILLIAC IV computer with a 64,000 mesh. The flow fields generated by the code are used as an experimental data base, to examine the behavior of the Reynols stresses in this simple, compressible flow. The variation of the structure of the stresses and their dynamic equations as the character of the flow changed is emphasized. The structure of the tress tensor is more heavily dependent on the shear number and less on the fluctuating Mach number. The pressure-strain correlation tensor in the dynamic uations is directly calculated in this simulation. These correlations are decomposed into several parts, as contrasted with the traditional incompressible decomposition into two parts. The performance of existing models for the conventional terms is examined, and a model is proposed for the 'mean fluctuating' part.

N82-11398/6 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
A Computer Solution to the Stationary Navier-Stokes Equations in Two Dimensions with Proven Convergence.
R. E. Gabrielsen. Sep 81, 11p NASA-TM-81300, A-8604
Prepared in Cooperation with Army Research and Technology Labs., Moffett Field, Calif. Sponsored in Part by Army Aviation Research and Development Command, St. Louis.

A general computer solution for the stationary Navier-Stokes equations is developed. It is explicity proved that this solution converges to the true solution as the grid size shrinks to zero.

PB82-802372 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Drag Reducing Fluids. 1969-October, 1981 (Citations from the NTIS Data Base).
Rept. for 1969-Oct 81.
Dec 81, 303p
Supersedes PB80-813264, NTIS/PS-79/0766, and NTIS/PS-78/0730.

Drag reducing and non-newtonian fluids, along with some studies on elastohydrodynamics, are researched. Theory, chemical formulations, test procedures, and applications are included. (This updated bibliography contains 295 citations, 15 of which are new entries to the previous edition.)

PB82-855768 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Fluid Flow Measurement Using Electromagnetic Fields. 1973-1981 (Citations from the BHRA Fluid Engineering Data Base).
Rept. for Jan 73-Dec 81.
Dec 81, 107p

The use of electromagnetic flowmeters for the determination of fluid flow is discussed in the cited reports. Emphasis is placed on the relationship between flow rate and fluid conductivity. Calibration procedures are also emphasized. Applications include the flow of liquids in pipelines as well as the measurement of ocean currents. (Contains 95 citations fully indexed and including a title list.)

PB82-859034 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Vibrational Analysis in Fluids. 1970-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 138p
Supersedes PB81-853681.

This bibliography cites reports relating to vibrational, fatigue, stress, and mechanical responses of fluids through a range of applications. The report discusses general areas of shapes and mechanisms working within and/or in conjunction with fluids. The general information is experimental in nature and could transfer to numerous fields. Specific data and procedures

include applications in mechanical engineering, hydrodynamics, hydraulics, and nuclear reactor technology. (This updated bibliography contains 140 citations, 20 of which are new entries to the previous edition.)

20E. Masers and Lasers

AD-A107 073/9 PC **A05**/MF **A01**
Northrop Research and Technology Center, Palos Verdes Peninsula, CA.
Device Development Program for Efficient Excitation of a Blue-Green Laser.
Final technical rept. 21 Aug 78-20 Aug 79,
D. E. Rothe, and W. H. Long, Jr. May 80, 83p Rept no. NRTC-80-10R
Contract N00014-78-C-0831

A novel transverse/longitudinal double-discharge device, operated as an XeCl laser, has been evaluated as part of an effort to increase the efficiency of discharge-excited lasers for the Navy's proposed blue-green communications system. Experimental results showed that the stable operating regime of such a device is limited to gas compositions and pressures which do not optimize the chemical laser kinetics for the rare-gas halides. Theoretical computer predictions are compared with the experimental results. (Author)

AD-A107 227/1 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
Fiber-Coupled External-Cavity Semiconductor High-Power Laser,
Robert H. Rediker, and Robert P. Schloss. 1980, 7p
Contract N00014-80-C-0941
Pub. in RLE Progress rept. no. 123, Sect 21, p142-143 Jan 81.

No abstract available.

AD-A107 304/8 PC **A06**/MF **A01**
Defense Intelligence Agency, Washington, DC. Directorate for Scientific and Technical Intelligence.
Bibliography of Soviet Laser Developments, Number 27, January - February 1977.
21 Nov 77, 104p Rept no. DIA-DST-1740Z-001-78
See also AD-A107 305.

No abstract available.

AD-A107 305/5 PC **A07**/MF **A01**
Defense Intelligence Agency, Washington, DC. Directorate for Scientific and Technical Intelligence.
Bibliography of Soviet Laser Developments, Number 26, October - December 1976.
25 Jul 77, 142p Rept no. DIA-DST-1740Z-001-77
See also AD-A107 304.

No abstract available.

AD-A107 306/3 PC **A05**/MF **A01**
Defense Intelligence Agency, Washington, DC. Directorate for Scientific and Technical Intelligence.
Bibliography of Soviet Laser Developments, Number 28, March - April 1977.
24 Feb 78, 90p Rept no. DIA-DST-1740Z-002-78
See also AD-A107 304.

This is the Soviet Laser Bibliography for March-April 1977 and is No. 28 in a continuing series on Soviet laser developments. the coverage includes basic research on solid state, liquid, gas, and chemical lasers; components; nonlinear optics; spectroscopy of laser materials; ultrashort pulse generation; theoretical aspects of advanced lasers; and general laser theory. Laser applications are listed under biological effects; communications; beam propagation; computer technology; holography; laser-induced chemical reactions; measurement of laser parameters; laser measurement applications; laser-excited optical effects; beam-target interaction; and plasma generation and diagnostics. (Author)

AD-A107 398/0 PC **A03**/MF **A01**
Stanford Univ., CA. Dept. of Chemistry.
Research on Metal Halide Laser Systems.
Research and development status rept. 1 Jan-1 Mar 78,
Richard N. Zare. 19 Jul 78, 35p
Contract N00014-77-C-0457, ARPA Order-2840

During this period we investigated the production of excited metal atoms by the photodissociation of volatile metal--encapsulated compounds. Specifically, we studied FE(CO)5, Fe(CO)3, CH2CHCHCH2, 1,1'dimethyl, ferrocene, Ni(CO)4, Zn(CH3)2, Mn(CO)5Cl and Mn(CO)6. In all cases atomic emission is observed when a few torr of the parent compound is irradiated by the 2458 angstroms output of a KrF laser (15mJ/pulse). Most of this grant period was devoted to the fabrication of the KrF laser. This device is presently operational and plans are underway to modify it so that it will also operate as a ArF laser (1930 angstroms output).

AD-A107 503/5 PC **A02**/MF **A01**
Kigre, Inc., Toledo, OH.
Fluorescent Glasses for Use in Fluorescently Pumping Nd 3(+) Doped Laser Glass.
Special rept.,
C. F. Rapp. Aug 81, 12p
Contract N00014-81-C-2376

In certain cases it may be desirable to fluorescently pump a neodymium doped laser glass rather than directly excite the laser glass with the light from a flashlamp. That is, the flashlamp energy is first absorbed in a fluorescent material which then reemits to fluorescently pump the Nd3+ laser glass. This fluorescent pumping could be beneficial in two ways; first, the short wavelength radiation which is not efficiently absorbed by the neodymium can be converted to wavelengths which are strongly absorbed; and, second, the conversion of short wavelength pump light to longer wavelengths will minimize the amount of heat generated in the laser rod. However, if the fluorescent material is to efficiently pump the neodymium, and not simply absorb and waste the short wavelength radiation from the flashlamp, it must display several characteristics.

AD-A107 527/4 PC **A02**/MF **A01**
Kigre, Inc., Toledo, OH.
The Development of a High Average Power Glass Laser Source.
Progress rept.,
John D. Myers. 31 Jul 81, 3p
Contract N00014-81-C-2376

Contents: Task 1: Q-100 Property Measurements; Task 2: The Cladding of Q-100; Task 3: Selective Filtering And/Or Energy Transfer to Reduce Thermal Loading; Task 4: Glass Strengthening; Task 5: Alternate Pump Sources.

ALO-4199-1 PC **A09**/MF **A01**
Westinghouse Research and Development Center, Pittsburgh, PA.
Operational Characteristics of 16 mu M CO sub 2 Laser. Final Technical Report, 1 February 1977-30 September 1980.
W. H. Kasner. Nov 80, 190p
Contracts AC04-77AL03914, AC04-78AL14199

The investigation of laser isotope separation (LIS) of uranium starting with UF sub 6 feed stock has required the development of new infrared lasers. Certain R branch lines of the 16 mu m bending mode transition, 02 exp 0 0 implies 01 exp 1 0, in CO sub 2 fall within one of the infrared wavelength regions of interest for this application. This report presents the results of experimental and theoretical studies of the operational characteristics of this 16 mu m CO sub 2 bending mode laser. The initial phase of the research program was devoted to a study of the feasibility of using simple pulsed electrical discharges as an excitation source for this laser system. The activities conducted under this phase of the program included: experimental studies of 16 mu m laser emission; development of a computer model to explain the observed experimental results and to predict behavior under other operating conditions; and development of a preliminary conceptual design for a deliverable laser system. (ERA citation 06:006377)

LA-tr-79-46 PC **A07**/MF **A01**
Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Garching (Germany, F.R.). Projektgruppe fuer Laserforschung.
Project Group for Laser Research. PLF Annual Report, 1978.
1979, 142p
Contract W-7405-ENG-36
Translation source information not available.

The organization and development of the Project Group for Laser Research are discussed. Cooperation of the Group with other scientific and technical institutions is noted. Research in the Departments of Plasma Physics and High Power Laser Development; Laser Chemistry; and Laser Spectroscopy is summarized. The isotope-selective excitation of UF sub 6 which is of interest in connection with uranium isotope separation, requires a laser which can be tuned exactly to an absorption line of the molecule in the region lambda equals 16 mu m. In the URANIT/PLF Project, possibilities for producing such radiation was studied. (ERA citation 05:017949)

NVO-1555-5 PC **A04**/MF **A01**
Honeywell Corporate Material Sciences Center, Bloomington, MN.
Development of Fluorides for High Power Laser Optics. Final Report, 1 April 1978-31 March 1980.
J. F. Ready, and H. Vora. Jul 80, 54p
Contract AC08-78DP40020

The following optical properties of both single-crystal and press-forged LiF were evaluated in the program: optical homogeneity at 633 nm, stress birefringence, scattering at 633 nm, residual absorption over the spectral range 339 to 3800 nm, and laser damage thresholds for 1-ns, 1064-nm and 700-ps, 266-nm laser pulses. The results of the optical characterization tasks indicate that LiF single crystals can be press-forged without seriously degrading their optical properties. The following mechanical properties of both single-crystal and press-forged LiF were evaluated: yield strength in compression, proportional limit and fracture strength in 3- and 4-point bending, fracture energy, and threshold for microyield. The results indicate that the mechanical properties of LiF single crystals can be improved significantly by press forging. (ERA citation 05:033121)

N82-11452/1 PC **A04**/MF **A01**
RCA Labs., Princeton, NJ.
InGaAsP/InP Laser Development for Single-Mode, High-Data-Rate Communications.
Interim Report, 1 Jul. 1980 - 31 Mar. 1981.
I. Ladany, E. R. Levin, C. W. Magee, and R. T. Smith. Nov 81, 59p NASA-CR-3477, PRRL-81-CR-12
Contract NAS1-15962

Materials studies as well as general and specific device development were carried out in the InGaAsP system. A comparison was made of three standard methods of evaluating substrate quality by means of dislocation studies. A cause of reduced yield of good wafers, the pullover of melt from one bin to the next, has been analyzed. Difficulties with reproducible zinc acceptor doping have been traced to segregation of zinc in the In/Zn alloy used for the doping source. Using EBIC measurments, the pn junction was shown to drift in location depending on factors not always under control. An analysis of contact structures by SIMS showed that the depth to which the sintered Au/Zn contact penetrates into the structure is typically 0.13 microns, or well within the cap layer and out of the p-type cladding and thus not deleterious to laser prformance. The problem of single-mode laser development was investigated and it was shown to be related to the growth habit over four different possible substrate configurations. The fabrication of constricted double heterojunctions, mesa stripe buried heterostructures, and buried heterostructures was discussed, and measurements were presented on the device properties of single-mode buried heterostructure lasers. Results include single spectral line emission at 3 mW and a threshold current of 60 mA.

N82-11453/9 PC **A05**/MF **A01**
Perkin-Elmer Corp., Danbury, CT.
Development of MBE Grown Pb-Salt Semiconductor Lasers for the 8.0 to 15.0 Micrometer Spectral Region.
M. D. Miller. Mar 81, 77p NASA-CR-165683
Contract NAS1-14996

Diodes lasers are fabricated using multiple source molecular beam expitaxial growth of (PbSn)Te on BaF2 substrates. Methods for crystal growth, crystal transfer, and device fabrication by photolithographic techniques were developed. The lasers operate in the spectra range from 10 microns to 14 microns and at temperatures from 12K to 60K continuous wave and to 95 K pulsed.

PB82-859059 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Ultraviolet Lasers. 1970-1981 (Citations from the Engineering Index Data Base).
Rept. for Jan 70-Dec 81.
Dec 81, 108p
Supersedes PB81-857039.

Reports are cited which discuss repetitive, tunable, high-power vacuum ultraviolet lasers. Special application coatings and methods of efficient generation for ultraviolet lasers, long pulse ultraviolet laser emissions, spectral characteristics of vacuum ultraviolet preionization sources for CO2 lasers, and experimental investigations of aero-acoustic effects in large-volume ultraviolet laser discharges are discussed. Ultraviolet laser performance evaluations and spectroscopy are included. (This updated bibliography contains 113 citations, 18 of which are new entries to the previous edition.)

PB82-859067 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Ultraviolet Lasers. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 105p
Supersedes PB81-860918. Prepared in cooperation with the Department of Energy, Washington, DC.

Citations in this bibliography consider the design, development, theory, and diagnostics of ultraviolet lasers. Electron-beam-pumped ultraviolet lasers, tunable and repetitive vacuum ultraviolet lasers, and research on frequency shifting of ultraviolet lasers is included. The use of ultraviolet lasers in chemistry is also included in this bibliography. (This updated bibliography contains 105 citations, 15 of which are new entries to the previous edition.)

20F. Optics

AD-A107 164/6 PC **A05**/MF **A01**
BDM Corp., Albuquerque, NM.
Evaluation of Spatial Filtering as a Means for Increasing Optical Performance in High Power Beam Trains.
Final technical rept.,
Carl Wiggins, George Lawrence, Lyn Skolink, and John Corcoran. 16 Sep 81, 76p Rept no. BDM/A-81-605-TR
Contract MDA903-80-C-0339, DARPA Order-C-007

This report consists of annotated vugraphs covering objectives of the subtask statement. The major results on the effectiveness of spatial filtering on highly nonuniform intensity distributions in high power laser beam trains should be of general interest to the optics community at large and will, upon proper authorization, be submitted for journal publication in the open literature. (Author)

AD-A107 218/0 Not available NTIS
Columbia Univ., New York.
Fluctuation Properties of Multiplied-Poisson Light: Measurement of the Photon- Counting Distribution for Radioluminescence Radiation from Glass,
Malvin Carl Teich, and Bahaa E. A. Saleh. 27 Mar 81, 5p ARO-16431.29-EL
Contract DAAG29-79-C-0079
Availability: Pub. in Physical Review A, v24 n3 p1651-1654 Sep 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 260/2 PC **A09**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Structural Design of a Large Deformable Primary Mirror for a Space Telescope.
Doctoral thesis,
James Gerald Raymond Hansen. 1981, 187p Rept no. AFIT-CI-81-15D

A 4 meter aperture deformable primary mirror is designed with the mirror and its supports integrated into a single structure. The integrated active mirror's minimal weight makes it desirable for a space telescope as well as a terrestrial application. Utilizing displacement actuators, the active controls at the mirror's surface include position control and slope control in both the radial and tangential directions at each of the 40 control points. Influence functions for each of the controls are nearly independent, reducing the complexity of the control system. Experiments with breadboard models verify the structural concept and the techniques used in the finite element method of computer structural analysis. The majority of this paper is a description of finite element analysis results. Localization of influence functions is exhaustively treated. For gravity loads, a thermal gradient through the mirror thickness, and a uniform thermal soak, diffraction limited performance of the 4m design is evaluated. Loads are applied to defocus the mirror and to cause fourth-order astigmatism. Mirror scallop, instigated by a focus shift, has been virtually eliminated with the 40-actuator design. The structural concept is so effective that it should be considered for uncontrolled primary mirrors as well as active mirrors.

AD-A107 301/4 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
Communications: Fiber-Coupled External Cavity Semiconductor Laser.
Annual summary rept. 1 Jul 80-30 Jun 81,
Robert H. Rediker. 1 Jul 81, 48p
Contract N00014-80-C-0941

The series combination of a semiconductor-diode gain element (a diode laser whose end facets have been antireflection coated) and an optical fiber has been placed inside an external cavity and the external cavity has lased in a single spectral line whose width was less than the 1.7 x 10 to the -5-nm resolution of the scanning Fabry-Perot interferometer used. When a grating in the Littrow configuration is used as one of the cavity end reflectors the spectral line can be tuned. Other elements such as a polarizer can also be placed inside the cavity to select a desired mode of operation. The addition of elements inside the external cavity (including the optical fiber) introduces loss which increases both the threshold current for laser operation and the ratio of power at the gain element facet to cavity output power. With optimized design the long mean life of the semiconductor laser can be maintained by reducing the output power per gain element by less than 33 percent. In terms of the overall goal of this program, The Fiber-Coupled External Cavity Semiconductor Laser, the results obtained are extremely encouraging. (Author)

AD-A107 475/6 PC **A04**/MF **A01**
Defence Research Establishment Valcartier (Quebec).
Telemetre Laser a Onde Entretenue a 10.6 micrometers avec Postdetection non Lineaire: Etude d'un Systeme a un Laser (A 10.6 micrometer Amplitude Modulated Telemeter Laser with Nonlinear Postdetection: Study of a Single Laser System),
D. Vincent, P. Lavigne, and G. Otis. Apr 81, 74p
Rept no. DREV-R-4201/81
Text in French; abstract in English.

We performed a theoretical and experimental study of a 10.6 micrometer heterodyne detection system with nonlinear postdetection. A single laser acts as both transmitter and local oscillator; the intermediate frequency is given by Doppler effect due to a rotating target. An electrooptic crystal amplitude-modulates the laser beam at a frequency of 15 kHz; a synchronous voltmeter measures this signal after the nonlinear element. Values of signal-to-noise ratio with respect to incident optical power are in agreement with the results of the theoretical model. In particular, experimentally measured target-induced frequency spreading effects on signal-to-noise ratio correspond to the predictions of the model.

AD-A107 493/9 PC **A02**/MF **A01**
Battelle Columbus Labs., OH.
Study of the Two-Photon Photorefractive Effect in Lithium Niobate,
Van E. Wood, Carl M. Verber, Rand C. Sherman, and Nile F. Hartman. 26 Oct 81, 7p ARO-15246.3-P
Contract DAAG29-78-C-0028

The dynamics and wavelength dependence of recording and optical erasure of thick phase gratings produced photorefractively were studied in undoped and in iron-doped lithium niobate. Properties of gratings formed at high incident power densities via two-photon absorption were compared with those of gratings formed at shorter wavelengths by the usual one-photon mechanism. Gratings formed by the two-photon mechanism in undoped crystals exhibit a distinctive two-exponential time dependence of optical erasure not observed in other circumstances. This shows that the nature of final trap states, as well as absorption and charge transfer characteristics, is important in controlling photorefractive sensitivity. A method was discovered for producing high diffraction efficiency gratings at infrared frequencies in titanium-diffused optical waveguides on lithium niobate. (Author)

LA-UR-79-2059 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Single-Point Diamond-Turned Mirror Performance Before and after Polishing.
J. E. Sollid. 1979, 4p CONF-790529-9
Contract W-7405-ENG-36
Conference on Optics, Los Alamos, NM, USA, 23 May 1979.

The surface finish of a single-point diamond-turned (SPDT) mirror produced in 1977 on the large (2-meter swing) Excello lathe at the Union Carbide Corporation's Y-12 Plant in Oak Ridge, Tennessee, was such that it was not possible to do visible alignment using it. Therefore, it was necessary to polish the mirror by hand. This was done at the University of Arizona. The intent was to remove the high ridges in the SPDT mirror but not to degrade the figure. Both interferometric and encircled energy measurements were made on the mirror before and after polishing. The mirror was an f/2 off-axis parabola 39.37 cm in diameter. The equation describing the generator of the mother parabola is y exp 2 = 309x(cm exp 2) and the center of each off-axis sister mirror is at x = 7.64 cm, and y = 48.59 cm. After polishing it was possible to align it using techniques which employed visible light. (ERA citation 04:055852)

N82-11207/9 PC **A04**/MF **A01**
IIT Research Inst., Chicago, IL.
Evaluation of the Effects of Solar Radiation on Glasses.
Final Report, 9 Jul. 1979 - 31 Dec. 1980.
Y. Harada. Aug 81, 61p NASA-CR-161907, IITRI-M06055-10
Contract NAS8-33388

Four optical materials were exposed to simulated solar and particulate radiation in a space environment. Sapphire and fused silica experienced little change in transmittance while optical crown glass and ultra low expansion glass darkened appreciably. A complete analysis of the 500 hour simulated space exposure test was conducted. Additionally, studies were performed to aid in sample selection for a 100 hour simulated exposure test.

PB82-131996 PC **A07**/MF **A01**
Rochester Univ., NY. Inst. of Optics.
Engineering Aspects of Gradient-Index Optical Systems.
Final rept. Jul 76-Dec 78,
Duncan T. Moore, Lisa Gregorka, and Stephen D. Fantone. Dec 78, 134p NSF/RA-780916
Grant NSF-ENG76-08994

A schlieren system of the z-type configuration is described which measures the chromatic dispersion of gradient refractive index optical glass samples. Components of the system, i.e., lenses, are composed of materials whose index of refraction varies in a prescribed manner. The chromatic dispersion is assessed by measuring the maximum slope of the gradient profile represented mathematically as a polynomial, as a function of wavelength. The schlieren instrument assesses the maximum slope by measuring light deflected by the samples. Angular deflections of light from 5-40 milliradians are typical for the samples measured. Eight gradient samples are measured by the schlieren system and the measurements compared to their documentation by a.c. interferometry. The accuracy is one and one-half to five times (dependent on gradient strength) that of a.c. interferometry. Also, the schlieren system has other distinct advantages in measuring maximum slopes when compared to a.c. interferometry. Suggestions for improvements and future investigations are presented. An appendix details the operating procedure of the schlieren system.

PB82-135179 PC **A03**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.

Measurement of Optical Fiber Bandwidth in the Frequency Domain.
Technical note,
G. W. Day. Sep 81, 48p NBS-TN-1046
Sponsored in part by Army Electronic Proving Ground, Fort Huachuca, AZ., and Department of Defense Calibration Coordination Group, Redstone Arsenal, AL.

The design, evaluation, and performance of a system for determining the magnitude of the transfer function(hence, bandwidth) of a multimode optical fiber are presented. The system operates to about 1450 MHz using a tracking generator/spectrum analyzer combination for narrowband detection. It is constructed, almost entirely, from commercially available components. The system is less complex and easier to use than an equivalent time domain system and the measurement precision is comparable. Background information on time and frequency domain specifications, fiber bandwidth limitations, and alternate frequency domain techniques is also presented.

PB82-859646 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Connectors for Fiber Optics. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for Jan 75-Dec 81.
Dec 81, 231p

This bibliography cites reports relating to fusion splicing, monofiber snap connectors, V-groove, triple ball and biconic connectors for fiber optic ribbons and cables. Built-in magnifiers, lens end, and index of refraction matching cable connectors are included. Joint loss and noise calculations for short and long haul systems are considered. (Contains 252 citations fully indexed and including a title list.)

20G. Particle Accelerators

DE81030972 PC **A02**/MF **A01**
Colorado Univ. at Boulder. Nuclear Physics Lab.
Rf Field Effects on the Cyclotron Arc Source.
R. A. Stern, R. E. Rodenburg, J. F. Benage, Jr., and D. A. Lind. 1981, 3p DOE/ER/40014-5, CONF-810944-5
Contract AC02-81ER40014
International conference on cyclotrons and their applications, Caen, France, 7 Sep 1981.

By exploiting recent developments in plasma physics a program to diagnose changes in source properties during ion beam extraction has been initiated to improve source efficiency. A small cyclotron with a conventional hooded arc provides radiation from excited species (H/sub beta / and the 4685 A line of HeII) which is spectrally analyzed and detected by a high-frequency photomultiplier. The intensity of the radiation is sensitive to changes in the electron and ion densities, and enables an analysis of the effect of the rf field on the plasma properties of the source. We have evidence that coupling of the rf extraction field to normal modes of the plasma - the Electrostatic Ion Cyclotron waves - occurs, permitting rf field penetration to the entire plasma column and large beam extraction. (ERA citation 06:035370)

JINR-9-11990 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
JINR Synchrophasotron Operation and Improvement (The Second Quarter of 1978).
V. P. Vadeev, M. A. Voevodin, and E. D. Donets. 1978, 12p
In Russian.
U.S. Sales Only.

The operation of the Dubna synchrophasotron in the 2nd quarter of 1978 when accelerating deuterons, C, O and Ne nuclei is presented. The KRION electron-beam source with improved characteristics has been used as a source of nuclei. This permits a marked increase of the nuclei intensity to be obtained at its output. The carbon, oxygen and neon nuclei are accelerated. The CKM-200 streamer chamber has been first exposed to an extracted beam of Ne nuclei with an energy of 4.1 GeV/nucleon. In order to get information on the accelerated beams of low intensity nuclei, new transmitters of two types are used. To improve the characteristics of the operating magnetic field, the work has been in progress during the synchrophasotron shutdown. A new system of geodetic measurements is used for more effective control of the position of the synchrophasotron electromagnet. Data on vertical motions of the electromagnet, obtained in two runs, are presented. (Atomindex citation 10:473734)

LA-8350-PR PC **A10**/MF **A01**
Los Alamos Scientific Lab., NM.
Accelerator Technology Program. Progress Report, April-December 1978.
E. A. Knapp, and R. A. Jameson. May 80, 208p
Contract W-7405-ENG-48

This report presents highlights of activities in the Accelertor Technology (AT) Division from April through December 1978. The report is divided into 10 sections to cover work done by the four groups that make up AT Division (AT-1, AT-2, AT-3, and AT-4). Section I is a brief summary of the whole report. Sections II through VI describe work done by At-1, the Linac Technology Group. Subjects covered are the Pion Generation for Medical Irradiation Program, the Electronuclear Fuel-Producing Accelerator Program, the Gyrocon rf Amplifier Program, the Electron Linear Accelerator Program, and the Free Electron Laser Program. Section VII covers the Linear Accelerator Beam Dynamics development, and Sec. VIII deals with work with the H exp - Ion Source. Most of the work in Secs. VII and VIII was done by AT-2, the Special Projects Group, although work on factors influencing emittance growth was done by MP-9, and results on emittance growth in the new European Council for Nuclear Research (CERN) linac were reported by an AT-DO/MP-9 team. Section IX concerns the Proton Storage Ring Program for which AT-3, the Storage Ring Technology Group, is responsible. Section X describes the Fusion Materials Irradiation Test (FMIT) Program. This work is done by AT-4, which was organized in April 1978 to design and supervise the construction of the FMIT accelerator. The accelerator team is composed of personnel from AT-4 and the Hanford Engineering Development Laboratory, Richland, Washington. This report covers the activities of the integrated team. This report covers the activities for the last 9 months of 1978. (ERA citation 05:027629)

LA-8405-MS PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Preliminary Simulation Studies of Accelerator Cavity Loading.
R. J. Faehl. Jun 80, 9p
Contract W-7405-ENG-36

Two-dimensional simulations of loading effects in a 350 MHz accelerator cavity have been performed. Electron currents of 1-10 kA have been accelerated in 5 MV/m fields. Higher order cavity modes induced by the beam may lead to emittance growth. Operation in an autoaccelerator mode has been studied. (ERA citation 05:034072)

LA-8444-MS PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Monochromatic Neutral Kaon Beam.
C. M. Hoffman. Jul 80, 8p
Contract W-7405-ENG-36

A design for a monochromatic, neutral kaon (K exp 0) beam, which could be constructed at a Kaon Factory, is described. Possible uses of such a beam are discussed. (ERA citation 05:034067)

LBL-8382 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Stability of Intense Transported BEAMS.
L. J. Laslett, and L. Smith. Mar 79, 4p CONF-790327-111
Contract W-7405-ENG-48
IEEE particle accelerator conference, San Francisco, CA, USA, 12 Mar 1979.

At the previous National Accelerator Conference, the transport of intense ion beams, with particular reference to Heavy Ion Fusion, was analyzed by finding matched solutions of the coupled envelope equations. This work established relations between lattice structure, beam dimensions and space-charge tune depression as a function of intensity. An investigation of the stability of the K-V distribution in transport by a periodic quadrupole system, a generalization of Gluckstern's analysis for a continuous solenoid is reported. The results are presented and compared with simulation computations for a particular case; the results provide a prediction of maximum transportable current without degradation of emittance due to instability. (ERA citation 04:053551)

NIIEFA-P-D-0411 PC **A02**/MF **A01**
Nauchno-Issledovatel'skii Inst. Elektrofizicheskoi Aparatury, Leningrad (USSR).
Distributive Cathodes in Duoplasmatron Ion Sources.
G. G. Voronin, A. I. Solnyshkov, G. V. Tarvid, and Z. G. Solnyshkova. 1979, 17p
In Russian.
U.S. Sales Only.

Presented are the results of studying the operation of distributive cathodes of a direct and indirect incandescence in duoplasmatron ion sources. The KP-25V direct-incandescent distributive cathode is a spiral of a porous tungsten impregnated with barium-calcium alumosilicate. It is shown that the KP-25V cathode provides emission current density up to 5 A/cm exp 2 in a continuous regime. Direct-incandescent distributive cathodes have certain advantages as compared to those of an indirect incandescence, i.e. they have a large emission surface and high reliability. Cathodes of the both types quickly recover their emission properties after being kept in air. Dependences of beam current and composition of ion beam drawn out of the NG-50 neutron generator duoplasmatron are presented to illustrate emission properties of ion source. Ion beam current up to 15 mA is provided at the content of atomic component up to 80%, the HG-50 operating with the diameter of emission hole of O.3 mm and discharge current of 3 A at the 0.2 mm diameter provided is ion beam current up to 5 mA. (Atomindex citation 10:491686)

20H. Particle Physics

CEA-CONF-4469 PC **A02**/MF **A01**
CEA Centre d'Etudes de Bruyeres-le-Chatel, Montrouge (France).
Evaluation of the Capture Cross Section of exp 169 Tm from 10 exp -5 EV to 2.10 exp 7 EV.
G. Simon, C. Philis, O. Bersillon, and E. Arthur. 1978, 3p CONF-780926-26
Symposium on neutron capture of gamma-ray spectroscopy, Upton, NY, USA, 18 Sep 1978.
U.S. Sales Only.

From 10 exp -5 eV to 760.6 eV a coherent resolved resonance parameter set was determined for exp 169 Tm, from which the capture cross section was calculated with the Reich-Moore formalism. From 760.6 eV to 20 MeV the capture cross section was calculated with the help of two statistical model codes COMNUC and GNASH. Realistic optical model parameters were obtained by the SPRT method. (Atomindex citation 11:496040)

DE81025788 PC **A02**/MF **A01**
Hawaii Univ., Honolulu.
Study of Neutrino-Produced Dimuons Using the Fermilab 15-Foot Bubble Chamber and External Muon Identifier.
V. Z. Peterson. Jan 79, 21p UH-511-328-79, CONF-780892-2
Contract AC03-76ER00511
Bubble chamber symposium, Sandai, Japan, 17 Aug 1978.

The external muon identifier and the new internal picket fence, special features of the Fermilab 15-foot bubble-chamber hybrid system, are described. (ERA citation 06:035585)

DE81030544 PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Relativistic Heavy-Ion Experiments.
H. G. Pugh. Aug 81, 30p LBL-13029, CONF-8106157-1
Contract W-7405-ENG-48
12. international symposium on multiparticle dynamics, South Bend, IN, USA, 21 Jun 1981.

Objectives of high energy nucleus-nucleus studies are outlined. Bevalac experiments on the formation of hot high-density equilibrated nuclear matter are discussed.

Future programs are outlined, including research at the CERN ISR. (ERA citation 06:035628)

DE81032037 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Comparison of the ENDF/B-V and SOKRATOR Evaluations of exp 235 U, exp 239 Pu, exp 240 Pu and exp 241 Pu at Low Neutron Energies.
G. de Saussure, and R. Q. Wright. 1981, 40p CONF-810957-1
Contract W-7405-ENG-26
Joint IAEA/NEA consultants meeting on uranium and plutonium resonance parameters, Vienna, Austria, 28 Sep 1981.

The US and USSR's most recent evaluationsof exp 235 U, exp 239 Pu, exp 240 Pu and exp 241 Pu are compared over the thermal region and over the first few resonances. The two evaluations rest on essentially the same experimental data base and the differences reflect different approaches to the representation of the cross sections or different weightings of the experimental results. It is found that over the thermal and resolved ranges the two evaluations are very similar. Some differences in approaches are briefly discussed. (ERA citation 06:035646)

IAEA-NDS-2(Rev.79/6)
PC **A08**/MF **A01**
International Atomic Energy Agency, Vienna (Austria). Nuclear Data Section.
EXFOR Dictionaries.
O. Schwerer, P. M. Attree, H. D. Lemmel, and P. M. Smith. Jun 79, 151p
U.S. Sales Only.

A collection of all agreed upon terms, keywords, codes, and abbreviations used in the exchange format (EXFOR) for the magnetic-tape exchange of nuclear reaction data between national and international nuclear data centres. In particular, the codes for defining the nuclear data categories (nuclear reactions, cross-sections, angular distributions, energy-spectra, resonance-parameters, etc); headings and units of data columns; bibliographic references; institutions, laboratories, countries; measurement facilities and methods; system-identifier and information-identifier keywords; etc. are included. (Atomindex citation 10:492309)

Juel-Spez-39 PC **A04**/MF **A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Kernphysik.
Realistic Nucleon-Nucleon Forces and the Structure of Atomic Nuclei.
H. Muether. May 79, 69p
In German.Thesis.
U.S. Sales Only.

The topics discussed are as follows: many-body problems for nuclei, mesonic and isobaric degrees of freedom and ground state properties of nuclei, particle-hole excitations in the Brueckner theory, shell model interactions and the generator-coordinate method. (Atomindex citation 11:504293)

JINR-E-1-11975 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Proton Spectra in High-Energy Pion-Nuclei Collisions Not Accompanied by Multiparticle Production.
Z. Strugalski, T. Pawlak, W Peryt, and J. Pluta. 1978, 12p
U.S. Sales Only.

Multiplicity, energy and angular distributions of protons of energies over 20MeV emitted in pion-xenon nuclei collisions at 3.5GeV/c are presented in reactions not accompanied by the multiparticle production.It is shown that the energy spectra of fast protons emitted forward and those emitted in backward direction are lying in the kinetic energy intervals 20-250 MeV. The ratio of the number of protons emitted in the forward direction to the number of those in backward direction equals 1.78+-0.11 in the sample of all 318 events, and 1.69+-0.20 in events with zero secondary pions. Asymmetry is shown in the azimuth angle distribution of protons; inmonotony of proton multiplicity distribution is seen. (Atomindex citation 10:493455)

JINR-E-1-11976 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Proton Multiplicity Distribution of High-Energy Pion-Nuclei Collisions.
Z. Strugalski. 1978, 13p
U.S. Sales Only.

A simple explanation and description of the fast proton multiplicity distribution in pion-nuclei collision events not accompanied by the multiparticle production is presented using an assumption of proton monotonous emission along pion path in transversing of it through the nuclear matter. The existence of the process of monotonous energy loss by high-energy pion passage through the nuclear matter is postulated. (Atomindex citation 11:496042)

JINR-E-1-12088 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Proton Multiplicity Distributions in High-Energy Hadron-Nuclei Collisions.
Z. Strugalski. 1979, 15p
U.S. Sales Only.

The fast proton emission process is analyzed in high-energy hadron-nuclei collisions. The formula describing the proton multiplicity distributions is derived. It describes well enough the proton multiplicity distribution of pion-nuclei and proton-nuclei collisions at 200 and 400 GeV. (Atomindex citation 11:496043)

JINR-E-1-12306 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Comparison of Charged Particle Multiplicity Distributions in p Tilde p and Pp Interactions and Verification of the Dual Unitarization Scheme.
B. V. Batyunya, I. V. Boguslavsky, and I. M. Gramenitsky. 1979, 10p
U.S. Sales Only.

The difference between antiproton annihilation and pp interactions has been discussed. Charged particle multiplicity distributions in anti pp interactions at 22.4 GeV/c were used to obtain antiproton annihilation characteristics. The comparison of the topological cross section of antipp interactions with those of non-diffractive pp interactions confirms the validity of dual unitarization. (Atomindex citation 11:507233)

JINR-E-1-12345 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Strange-Particle Cross Sections from Four-Prong pi exp - p Interactions at 16 GeV/C.
E. Balea, C. Coca, V. M. Karnaukhov, V. I. Moroz, and G. Kellner. 1979, 12p
U.S. Sales Only.

The results of the investigation of exclusive four-prong pi exp - p interactions with strange particle production at a primary momentum of 16 GeV are presented. The data are based on a sample of about 100,000 pictures taken at CERN using 2 m hydrogen bubble chamber. The problems connected with corrections to the data and determination of cross sections are discussed. Cross sections are given only for final states involving at least an observed V exp 0 decay. For some reactions comparison with cross sections obtained in other experiments of different primary pi exp - momenta is presented. (Atomindex citation 11:507229)

JINR-E-2-12127 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Deep Inelastic Lepton-Nucleus Scattering.
Ya. Z. Darbaidze, V. R. Garsevanishvili, and Z. R. Menteshashvili. 1979, 14p
U.S. Sales Only.

Deep inelastic scattering of charged leptons on nuclei is considered in the lowest order in electromagnetic interaction. Expressions for the corresponding differential cross sections are obtained provided the scattered lepton and the fragment of the initial nucleus are detected in coincidence. Structure functions are analyzed by means of the automodelity principle. These functions are considered in the framework of the "light front" formalism for many-body systems. A hypothesis is put forward on the scale invariance of structure functions with respect to the xi-variable, which is some complicated dimensionless combination of kinematic invariants. A simple relation of this variable to the momenta of the nucleons inside the initial nucleus is pointed out. (Atomindex citation 10:493186)

JINR-R-1-11654 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Xi exp 0 Hyperon in the pi exp - p Interactions at 16 GeV/C.
E. Balya, Sh. Berchanu, K. Koka, V. M. Karnaukhov, and V. I. Moroz. 1978, 8p
In Russian.
U.S. Sales Only.

xi exp 0 -hyperon production in 16 GeV/c pi exp - p interactions in the 2 m CERN hydrogen bubble chamber has been detected. The xi exp 0 -production channel has been identified, and the particle angular distribution for the pi exp - p interaction in c.m.s. is presented. The lower limit for xi exp 0 -hyperon cross section in pi exp - p interactions is (44/sub-37//sup +101/) mu b. (Atomindex citation 11:507230)

JINR-R-1-12315 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Hyperfragment Production in Proton-Nucleus Interactions at 70 and 250 GeV.
S. A. Bunyatov, V. S. Kurbatov, V. V. Lyukov, V. M. Sidorov, and V. A. Yarba. 1979, 16p
In Russian.
U.S. Sales Only.

The hyperfragment production in proton-nucleus interactions in photoemulsions at 70 and 250 GeV is researched. 18 mesic decays of hyperfragments at 70 GeV and 18, at 250 GeV are detected. The frequency of observation of mesic decays of the hyperfragments with the ranges R < or approximately 500 mu m is equal to (2.25 +- 0.68)x10 exp -4 per one interaction at 70 GeV and (1.83 +- 0.48)x10 exp -4 at 250 GeV. As a result of the kinematical analysis the decays /sub lambda / exp 12 C implies pi exp -12 N and /sub lambda / exp 11 B implies pi exp -11 C/sup */ (E/sup */ = 4.31 or 4.79 MeV) are identified for the first time. (Atomindex citation 11:501595)

JINR-R-2-12079 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Nucleus-Nucleus Interaction in the Glauber Approximation.
V. V. Uzhinskii, and C. Tsehrehn. 1979, 18p
In Russian.
U.S. Sales Only.

A short review of nucleus-nucleus interaction at high energies is presented. The problem of elastic scattering is considered. The total cross section of nucleus-nucleus interaction is calculated by using the phase function obtained earlier. The hypothesis of the total cross section factorization is tested. A concrete method for calculating these processes is given. The correct transition of optical limit over atomic numbers of colliding nuclei permits me to solve the problem of elastic nucleus-nucleus scattering and to consider some inelastic reactions. (Atomindex citation 10:475782)

JINR-R-2-12154 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Hadron Production in Quark Combination with Colors.
V. V. Anisovich, and Yu. Niri. 1979, 14p
In Russian.
U.S. Sales Only.

The effect of the quark color correlations on the ratio of mesons, baryons and antibaryons M:B:anti B is considered in the multiparticle production processes. It is shown that, if the quark baryon number appears as the probability of the production of baryon states by this quark, then the ratio of M:B:anti B in the central region depends only slightly on the color correlations, and its value is near to that which was obtained earlier without considering the color. (Atomindex citation 11:501309)

JINR-R-2-12302 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Correlations of Identical Particles in the "Resonance + Particle" System.
R. Lednicky, and M. I. Podgoretskij. 1979, 11p
In Russian.
U.S. Sales Only.

The case is considered when one of two identical particles and a resonance giving the other identical particle are produced in different space-time points. It is shown that in such processes the correlations of identical particles are determined by the resonance decay range l as well as by the dimension R of the interaction range. The dependence of correlations on R may be used to separate the considered processes from the reactions of joint resonance and particle production in the same space-time point. (Atomindex citation 11:507143)

JINR-R-2-12395 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Relativistic Quantum Mechanics of Scalar Field.
V. N. Strel'tsov. 1979, 15p
In Russian.
U.S. Sales Only.

The relativistic quantum mechanics of a complex field has been developed in the framework of which in an explicit form in the expressions for charge Q and momentum P/sup j/ of the field there are considered the terms taking into account the relativity of simultaneity and depending on current density and four-momentum density, respectively. The expressions for Q and P/sup i/, obtained in the momentum space, coincide with the conventional ones. The relativistic position operator x exp 1 is introduced that has the same form as for a non-relativistic approximation. The relativistic analogues of the Ehrenfest theorems are derived. The relativistic invariant definition is given for a three-dimensional delta-function. (Atomindex citation 11:506400)

JINR-R-2-12470 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Investigation of the Problem of Massive Particle Capture by Quantum Scalar Field. Determination of the Effective Mass of the System.
Sh. I. Vashakidze, and V. A. Matveev. 1979, 9p
In Russian.
U.S. Sales Only.

The problem of massive particle capture by scalar quantum field is studied with the help of the Bogolyubov collective coordinate method. The methods of the system effective mass determination are considered. It is shown that the determination method of the mass, based on the explicit consideration of the system energy dependence on the total momentum, is equivalent to the traditional method which maintains the system velocity determination. That the effective mass consists of two parts - the inert mass of the particle and the "adjoint" mass, associated with the polarization near the particle. Results are illustrated with the help of the Hamiltonian model. (Atomindex citation 11:506411)

JINR-R-4-12399 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Shape of Fast Rotating Heated Nuclei. Calculation Results.
A. V. Ignatyuk, I. N. Mikhailov, Kh. L. Molina, R. G. Nazmitdinov, and K. Pomorski. 1979, 19p
In Russian.
U.S. Sales Only.

The model formulated earlier is used for studying the shape of the fast rotating heated nuclei. It is found that at the temperature t > = t/sub cr/ approximately 1-1.2 MeV corresponding to the excitation energy U > = U/sub cr/ approximately 14-17 MeV the shell effects do not affect the shape of rotating nuclei (t/sub cr/ and U/sub cr/ are characteristic temperature and energy, respectively). The region of spins and the excitation energy are found in which large shape fluctuations are expected. At t > = t/sub cr/ the calculated value of the level density parameter is well reproduced by the formula a = A/11.5 MeV exp -1 . (Atomindex citation 11:507385)

JINR-R-4-12509 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Weak and Electromagnetic Characteristics of Pseudoscalar Mesons in the Nonlocal Quark Model.
M. A. Ivanov, and V. A. Okhlopkova. 1979, 12p
In Russian.
U.S. Sales Only.

Weak semileptonic and electromagnetic decay characteristics of pseudoscalar mesons are calculated in the framework of the nonlocal quark model: 1) the pion and kaon electromagnetic radii; 2) Ksub(l3)-decay form factors; 3) pi implies e nu gamma decay structural constants. The results are obtained in satisfactory agreement with experiment. (Atomindex citation 11:507121)

KFKI-1979-78 PC **A03**/MF **A01**
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
Time Correlation in Two-Photon Decay.
P. Hrasko. Nov 79, 26p
U.S. Sales Only.

The relative time distribution of the photons emitted in a second order non-cascade process b implies a+2 gamma is investigated under the assumption that only those photon pairs are detected which were emitted a sufficiently long time after the preparation of the decaying state. An anticorrelation between the photons is found and attributed to the propagation of one of the photons backward in time. (Atomindex citation 11:507114)

LA-UR-79-2890 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Delayed Neutron Calculations Using ENDF/B-V Data.
T. R. England, R. E. Shenter, and F. Schmittroth. 1979, 5p CONF-791058-11
Contract W-7405-ENG-36
International conference on nuclear cross sections for technology, Knoxville, TN, USA, 22 Oct 1979.

Data from 20 fission yield sets in ENDF/B-V are used with the emission probabilities (Pn) of 105 delayed neutron precursors to calculate 6-group and total equilibrium delayed neutron yields of (anti nu /sub d/). Results are compared with recent evaluations and selected measurements of anti nu /sub d/. Least-squares data adjustment methods are in progress to improve agreement; preliminary results indicate significant improvement when fission yields are adjusted. 2 tables. (ERA citation 05:003830)

LA-UR-80-1976 PC **A02**/MF **A01**
Texas Univ. at Austin.
Measurement of K/sub NN/, K/sub SS/, K/sub SL/ , and K/sub LL/ in Polarized Np Implies Polarized Pn at 800 MeV in the CEX Region.
R. D. Ransome, C. L. Hollas, and P. J. Riley. 1980, 4p CONF-800824-16
Contract W-7405-ENG-36
International symposium on polarization phenomena in nuclear physics, Santa Fe, NM, USA, 11 Aug 1980.

The spin transfer parameters K/sub NN/, K/sub SS/, K/sub SL/, and K/sub LL/ have been measured for np elastic scattering at 800 MeV between 165 exp 0 and 180 exp 0 c.m. The parameters K/sub NN/ and K/sub LL/ are in good agreement with the quasi-free reaction polarized pd implies polarized npp at 180 exp 0 . (ERA citation 05:034274)

LA-UR-80-2235 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Role of Valons in Low-p/sub T/ Physics.
R. C. Hwa. 1980, 15p CONF-8006108-2
Contract W-7405-ENG-36
11. international symposium on multiparticle dynamics, Bruges, Belgium, 22 Jun 1980.

Hadron structure is described in the framework in which a nucleon is treated as a composite system of three valence quark clusters, called valons. Their momentum distribution is extracted from deep inelastic scattering data. The valon representation provides a quantitative description of the recombination function, which characterizes the hadronization of quarks. A formalism is then developed in terms of valons and quarks such that the inclusive distributions for hadronic reactions at low-p/sub T/ can be calculated without free parameters. 1 figure. (ERA citation 05:034293)

LA-UR-80-2427 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Polarization Transfer in Inelastic Scattering.
J. M. Moss. 1980, 10p CONF-800824-20
Contract W-7405-ENG-36
International symposium on polarization phenomena in nuclear physics, Santa Fe, NM, USA, 11 Aug 1980.

Polarization transfer experiments are now feasible for inelastic scattering experiments on complex nuclei. Experiments thus far have dealt with the spin-flip probability; this observable is sensitive to the action of spin-spin and tensor forces in inelastic scattering. Spin-flip probabilities at E approx. 40 MeV in isoscalar transitions in exp 12 C(12.71 MeV) and exp 15 O(8.89 MeV) show considerable deviation from DWBA-shell model predictions; this deviation indicates evidence for more complex reaction mechanisms. Experiments at intermediate energies will soon be possible and will yield data of much higher precision than is possible at lower (E < 100 MeV) energies. These experiments hold exciting promise in such areas as nuclear critical opalescence. 7 figures, 1 table. (ERA citation 05:034319)

LA-UR-80-2450 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Calculability of the n-p Mass Difference in Gauge Theories.
J. Kiskis. 1980, 7p CONF-800724-13
Contract W-7405-ENG-36
20. international conference on high energy physics, Madison, WI, USA, 17 Jul 1980.

The requirement of a calculable n-p mass difference leads to a consideration of unified gauge theories. Future developments in grand unified models may provide a realistic framework for the calculation of the n-p mass difference. The possibility that the relatively soft ultraviolet behavior of QCD softens the divergence in the lowest-order electromagnetic mass shift is considered in detail. It is shown that, if the bare mass and QCD coupling are constrained to be independent of the electromagnetic coupling, as is natural, then the lowest-order electromagnetic shifts of the renormalized mass and QCD coupling are infinite. (ERA citation 05:032935)

LA-UR-80-2496 PC **A04**/MF **A01**
Los Alamos Scientific Lab., NM.
Self-Consistent Theory of Hadron-Nucleus Scattering. Application to Pion Physics.
M. B. Johnson. 1980, 52p
Contract W-7405-ENG-36

The requirement of using self-consistent amplitudes to evaluate microscopically the scattering of strongly interacting particles from nuclei is developed. Application of the idea to a simple model of pion-nucleus scattering is made. Numerical results indicate that the expansion of the optical potential converges when evaluated in terms of fully self-consistent quantities. A comparison of the results to a recent determination of the spreading interaction in the phenomenological isobarhole model shows that the theory accounts for the sign and magnitude of the real and imaginary part of the spreading interaction with no adjusted parameters. The self-consistnt theory has a strong density dependence, and the consequences of this for pion-nucleus scattering are discussed. 18 figures, 1 table. (ERA citation 05:034354)

LA-8179-MS PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Differential Cross Sections for p + exp 3 He Scattering from 19.5 to 47.5 MeV.
R. E. Brown, B. T. Murdoch, D. K. Hasell, A. M. Sourkes, and W. T. H. van Oers. Jul 80, 16p
Contract W-7405-ENG-36

Differential cross sections have been measured at 11 energies from 19.5 to 47.5 MeV. The most forward center-of-mass angle for the angular distributions varies from 10.1 to 13.4 exp 0 , and the most backward angle varies from 163.2 to 173.4 exp 0 . The relative errors are usually less than 2%, and the scale error is 1.5%. The present data and the existing vector-analyzing power and total-reaction cross-section data are being analyzed in this energy range using the Los Alamos Scientific Laboratory R-matrix code EDA. (ERA citation 05:034313)

LA-8215-MS PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Exp 3 H(p,N) exp 3 He Differential Cross Sections Below 5 MeV and the n- exp 3 He Cross Sections.
M. Drosg. Jul 80, 11p
Contract W-7405-ENG-36

Complete angular distributions for the exp 3 H(p,n) exp 3 He reaction were measured at 2.5 and 4.0 MeV with the exp 1 H(t,n) exp 3 He reaction used to obtain the backward yields. Because the distributions are peaked about 17% more strongly in the backward direction

than the best previous elevation suggests (based on extrapolated data), the exp 3 H(p,n) exp 3 He reaction cross sections below 5 MeV were re-evaluated without the extrapolated data. The results were compared with recent total n- exp 3 He cross-section results. 3 figures, 4 tables. (ERA citation 05:031291)

LA-8298-PR PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Applied Nuclear Data Research and Development. Progress Report, October 1-December 31, 1979.
C. I. Baxman, and P. G. Young. Mar 80, 31p
Contract W-7405-ENG-36

This report describes the activities of the Los Alamos Nuclear Data Group for the period October 1 through December 31, 1979, in the following areas: theory and evaluation of nuclear cross sections; nuclear cross section processing; and fission product and actinides: yields, decay data, depletion, and buildup. Sections containing significant amounts of data are abstracted and indexed individually. 7 figures, 9 tables. (ERA citation 05:032946)

LA-8418-PR PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Applied Nuclear Data Research and Development. Progress Report, January 1-March 31, 1980.
C. I. Baxman, and P. G. Young. Jun 80, 38p
Contract W-7405-ENG-36

Activities of the Los Alamos Nuclear Data Group for the period January 1, 1980 through March 31, 1980 are described. The work fell into three principal categories: theory and evaluation of nuclear cross sections; nuclear cross section processing, and fission products and actinides: yields, decay data, depletion, and buildup. Individual abstracts were prepared for two of the sections in this report. 25 figures, 16 tables. (ERA citation 05:032948)

LAL-78-32 PC **A03**/MF **A01**
Paris-11 Univ., Orsay (France). Lab. de l'Accelerateur Lineaire.
Hadronic Cross Sections Study in E exp + E exp - Collisions from 1.350 GeV to 2.125 GeV.
G. Cosme, B. Dudelzak, and B. Grelaud. Dec 78, 28p
U.S. Sales Only.

The results of the first experiment performed at DCI in e exp + e exp - annihilations in the c.m. energy range 1.350-2.125 GeV are presented. The cross sections of various multipion channels are extracted. Significant structure appears in some specific channels. A relatively narrow resonance around 1.660 GeV decaying into 3 pi 's is found. Charged and neutral multiplicities, and also the ratio, R, are given. (Atomindex citation 11:507252)

LPC-79-03 PC **A03**/MF **A01**
College de France, Paris. Lab. de Physique Corpusculaire.
Review on Photon-Photon Collisions in Electron Storage Rings.
P. Kessler, J. Parisi, C. Carimalo, and N. Arteaga-Romero. Mar 79, 36p
In French.
U.S. Sales Only.

The historical evolution of the idea of photon-photon collisions in electron storage rings is described, as well as the main characteristics of these processes (cross sections, background rejection, effects of kinematic cuts, physical interest). Both old and recent experimental results (from VEPP-2, ADONE, DORIS and DCI) obtained in this field are shown. The crucial problem of electron tagging near 0 exp 0 is specially discussed. In conclusion, prospects of photon-photon collision experiments in the future, involving e exp + e exp - colliding beams of very high energy (PEP, PETRA, LEP), are briefly discussed. (Atomindex citation 11:507266)

LPNHEP-T-78-01 PC **A07**/MF **A01**
Paris-6 Univ. (France).
Meson F sub 1 Spin and Parity Measurement.
L. de Crespin de Billy. 1979, 150p
In French.Thesis.
U.S. Sales Only.

Data of several series of antiproton-proton annihilation events produced at 1.1 to 2.04 GeV/c are analyzed. The meson resonances with three-body decay (KantiK pi) and particularly the F sub 1 meson, of which quantum numbers spin and parity were not yet determined, were studied. In the antiproton-proton reaction, it was possible to demonstrate the existence of the F sub 1 meson. To test the spin, this experiment used the following processes: the 'angular correlation' tests using the production of F sub 1 associated with the omega as well as the sequential decays F sub 1 implies K*K, K* implies K pi ; the 'positivity' tests, which are directly connected with positivity conditions of the F sub 1 polarization density operator and use only the decay F sub 1 implies K*K. The coherence in the measures obtained in several independent tests allowed one to conclude with good experimental evidence that the spin-parity hypothesis J/sub F sub 1 //sup P/ = 2 exp - is the most probable. (Atomindex citation 11:507253)

NIIAR-1(360) PC **A03**/MF **A01**
Nauchno-Issledovatel'skii Inst. Atomnykh Reaktorov, Dimitrovgrad (USSR).
Shape of Prompt Neutron Spectrum from exp 252 Cf Spontaneous Fission.
B. I. Starostov, A. F. Semenov, and V. N. Ne'◦◦ov. 1979, 27p
In Russian.
U.S. Sales Only.

The spectrum of prompt neutrons from the exp 252 Cf spontaneous fission has been measured by the time-of-flight method within the wide energy range of 0.01-10 MeV using detectors based on exp 235 U. The results of studies are analyzed and weight average of spectrum within the energy range from 0.01 to 12 MeV is calculated. On the basis of the data obtained the spectrum excess over the Maxwell distribution is shown to be equal to approximately 20% within the energy range of 0.05-0.15 MeV and to 5-7% within the energy range of 0.15-0.4 MeV. (Atomindex citation 11:501661)

PB82-135732 PC **A02**/MF **A01**
Oxford Univ. (England). Nuclear Physics Lab.
Transverse Properties of Hadrons Produced in Neutrino-Nucleon Scattering in BEBC,
B. Saitta. 1981, 21p 87/81

The dependence o ı W of the transverse momentum of hadrons produced ı neutrino-nucleon charged current interactions is stuaied in detail. It is found that in the available W range, the growth of the average transverse momentum squared is not mainly in a plane but the in and out components increase with W at about the same fractional rate. Analyses of energy flow and angular distributions in planar events do not show convincing evidence for high energy, wide angle gluon radiation.

PB82-135740 PC **A02**/MF **A01**
Oxford Univ. (England). Nuclear Physics Lab.
A Study of the (26)Mg((12)C,(12)B)(26)Al Charge Exchange Reaction,
A. Etchegoyen, D. Sinclair, S. Liu, M. C. Etchegoyen, and D. K. Scott. 1981, 25p 82/81

The reaction (26)Mg((12)C,(12)B) (26)Al (5+,3+) has been studied using a beam of 102 MeV of (12)C. Shell-model, microscopic direct model and coupled reaction channels calculations have been performed, for comparison with the experimental data.

PB82-137381 Not available NTIS
National Bureau of Standards, Washington, DC.
Model for the Hadron-Hadron Vertex: Dynamic Origin of the OZI Rule.
Final rept.,
Michael Danos, and Daniela Zanon. 1981, 4p
Pub. in Lettere al Nuovo Cimento 31, n2 p61-64 1981.

It is shown that asymptotic freedom leads to a reaction mechanism which explains the experimental data of low energy hadron vertices, including the OZI rule.

PB82-859695 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Gravitational Effects on Particle Motions. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jan 72-Dec 81.
Dec 81, 239p
Supersedes PB81-852600. Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

Citations in this bibliography cover theoretical and analytical studies of the effects of gravity upon the motions and distributions of microscopic and macroscopic, charged and neutral, and relativistic and nonrelativistic particles throughout the universe. Much of the emphasis is placed upon cosmological, astrophysical, and planetological principles and analyses. Particles considered range from asteroids to rain drops to ions to relativistic tachyons. (This updated bibliography contains 255 citations, 35 of which are new entries to the previous edition.)

20I. Plasma Physics

AD-A107 455/8 PC **A08**/MF **A01**
Naval Postgraduate School, Monterey, CA.
A Computer Analysis of the Plasma-Boundary Layer Behavior over a Positive Electrode.
Master's thesis,
Stephen Ted Van Brocklin. Jun 81, 160p

A stable numerical procedure for solving the coupled, nonlinear equations of electron and ion conservation and electrical potential (Poisson's equation), is described. A two-dimensional model with periodic active sites on a flat plate is utilized to obtain both qualitative and quantitative results which clearly illustrate the self-generating sheath and ambipolar regions adjacent to a non-emitting electrode. The active sites are characterized as voltage sources and by electron densities depressed from both the non-active wall and the free-stream values. Various cases of species density at the nonactive wall are evaluated. Recombination/ionization plays an important role in establishing the boundary layer behavior in the ambipolar region and in the dimensionality of the problem formulation. Application is for Nitrogen gas at one amagat in pulsed discharge of about 50 micro-seconds in duration. Results clearly demonstrate the boundary layer nature of the species density at the electrode. A sheath length of 38 microns about a 35-volt active site and 5-20 microns along the non-active portion of the electrode is established. Joule heating is determined to be not important. (Author)

AD-A107 467/3 PC **A02**/MF **A01**
California Univ., Berkeley. Electronics Research Lab.
Plasma Theory and Simulation.
Quarterly progress rept. no. 2, 1 Apr-30 Jun 81,
C. K. Birdsall. 30 Jun 81, 21p
Contracts N00014-77-C-0578, DE-AT03-76ET53064
Sponsored in part by Contract De-AM03-76SF00034.

Contents: Plasma Theory and Simulation; Lower-Hybrid Drift Instability: 2d Simulations and Nonlocal Theory; Hybrid Simulations of Theta-Pinch Rotational Instabilities; Stability of the Thermal-Barrier Cell of a Tandem Mirror: Electrostatic Simulations; Alfven Ion Cyclotron Instability: Physical Description; Relativistic Quantum Formulation of the Boltzmann Collision Integral; Code Development and Maintenance; Implicit Particle Simulation Using Moments with Orbit Averaging; Plasma Sheath Simulation in 1d; Quiet-Start Method Comparisons: Random, Bit-Reversed, and Fibonacci Numbers; Summary of Reports, Talks, Publications, Visitors.

AD-A107 468/1 PC **A03**/MF **A01**
California Univ., Berkeley. Electronics Research Lab.
Quasineutral Hybrid Simulation of Macroscopic Plasma.
Memorandum rept.,
Douglas S. Harned. 14 Sep 81, 31p Rept no. UCB/ERL-M81/71
Contract N00014-77-C-0578

A method for solving the quasineutral hybrid plasma equations in two dimensions is presented, using full ion dynamics and inertialess electrons. The method is extended to allow plasma-vacuum interfaces of arbitrary shape. The algorithm is applied to the study of rotational instabilities in theta pinch Vlasov equilibria. (Author)

AECL-6343 PC **A07**/MF **A01**
Atomic Energy of Canada Ltd., Chalk River (Ontario). Chalk River Nuclear Labs.
Laser-Matter Interaction.
F. C. Khanna. Sep 78, 148p PASS-6-1
U.S. Sales Only.

A brief summary is given of the physics of the problem of laser-mater interaction. In the limit of very low intensities, the absorption is dominated by inverse bremsstrahlung. At higher intensities and in a homogeneous medium, there are several parametric processes that may become significant. The threshold intensities for the onset of several parametric instabilities are listed. Results for threshold intensities and growth rates just above threshold are briefly discussed for an inhomogeneous plasma. A brief description of resonance absorption in an inhomogeneous plasma is included. (Atomindex citation 11:519353)

LA-UR-80-738 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Resistive G-Modes and Ballooning.
R. Y. Dagazian, J. P. Mondt, and R. B. Paris. 1980, 12p CONF-800435-1
Contract W-7405-ENG-36
Workshop on optimization of toroidal confinement, Hiroshima, Japan, 14 Apr 1980.

A unified theory of the linear stability of the Roberts and Taylor type of resistive interchange and ballooning is presented. The effects of both parallel and perpendicular viscosity as well as of finite shear and finite beta are included in a MHD treatment of the problem. Kinetic effects are also studied. The hybrid kinetic model with Vlasov ions and guiding center electrons has been appropriately generalized to allow for electron-ion collisions. The geometry is that of a plane slab with magnetic shear. (ERA citation 05:021493)

NIIEFA-K-0357 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow.
Photoemulsion Method Application for Investigation of Plasma Neutron Radiation.
B. V. Gubinskii, V. D. Dyatlov, V. A. Kuz'min, and A. N. Popytaev. 1978, 20p
In Russian.
U.S. Sales Only.

The computer method application for reconstructing neutron differential energy spectra and calculating the flux from a point (laser plasma) and expanded (THETA-pinch) sources according to the measurement results of the energy spectrum and recoil proton density in nuclear photoemulsions has been developed. The method with the help of which the effect of neutron flying angle scattering on measurement of their spectrum for the point source is described. It is shown that the determination of neutron spectra with the energy of about 3 MeV is possible with the resolution not less than 0.25 MeV. While measuring the expanded source spectrum its form permits to judge the nature and average energy of the neutrons. The method is used for measuring neutron fluxes and energy spectra at the experiments on heating of deuterium plasma. (Atomindex citation 10:492768)

N82-11925/6 PC **A03**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Least Squares Autoregressive (Maximum Entropy) Spectral Estimation for Fourier Spectroscopy and Its Application to the Electron Cyclotron Emission from Plasma.
N. Iwama, A. Inoue, T. Tsukishima, M. Sato, and K. Kawahata. Jul 81, 47p IPPJ-530
Presented at the 5TH Intern. Conf. On Infrared and Millimeter Waves, Wuerzburg, West Germany, 6-10 Oct. 1980.

A procedure for the maximum entropy spectral estimation is studied for the purpose of data processing in Fourier transform spectroscopy. The autoregressive model fitting is examined under a least squares criterion based on the Yule-Walker equations. An AIC-like criterion is suggested for selecting the model order. The principal advantage of the new procedure lies in the enhanced frequency resolution particularly for small values of the maximum optical path-difference of the interferogram. The usefulness of the procedure is ascertained by some numerical simulations and further by experiments with respect to a highly coherent submillimeter wave and the electron cyclotron emission from a stellarator plasma.

N82-11926/4 PC **A02**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
An Energy Integral and Variational Principle for Plasma Kinetic Modes.
S. I. Itoh, K. Itoh, and Y. Terashima. Aug 81, 15p IPPJ-531

An energy principle is extended to include kinetic processes, finite gyroradius effects and wave-particle interactions, in electromagnetic instabilities in a toroidal plasma. The present arguments are based on the energy integrals which are derived from the eigenmode equations for electromagnetic perturbations. Inclusion of the finite gyroradius effects in the energy integral shows that this integral can be used for eigenmode by minimizing the excess energy of the pertubed state. The extended stability conditions for kink-like mode and ballooning mode are obtained by use of this improved energy principle. For the case where wave-particle interaction is important, the energy integral becomes a rate equation of energy exchange, and a variational form can independently be constructed for the mode analysis.

N82-11928/0 PC **A02**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Oblique Propagation of Electron Thermal Modes Below the Electron Plasma Frequency Without Boundary Effects.
T. Ohnuma, T. Watanabe, and H. Sanuki. Aug 81, 17p IPPJ-533

The propagation characteristics and refractive effects of an oblique electron thermal mode without boundary effects below the electron plasma frequency were studied experimentally and theoretically in an inhomogeneous magnetized plasma. The behavior of this mode observed experimentally was confirmed by the theoretical analysis based on a type of ray theory.

PB82-859745 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Plasma Solitons. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jan 72-Dec 81.
Dec 81, 318p
Supersedes PB81-859456. Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

Citations in this bibliography cover theoretical and analytical considerations and experimental observations of plasma solitons (solitary waves). The formation or excitation mechanisms, structure and stability characteristics, propagation and interaction dynamics, and perturbation-induced modifications of solitons in both natural and man-made plasmas are presented. (This updated bibliography contains 380 citations, 103 of which are new entries to the previous edition.)

20J. Quantum Theory

JINR-E-2-12364 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
OSp(1,4)-Superfields in Chiral Representation.
E. A. Ivanov, and A. S. Sorin. 1979, 19p
U.S. Sales Only.

The properties of OSp(1.4)-superfields in splitting (chiral)parametrization of the superspace of OSp(1.4)/O(1.3) are studied. The connection is found between the real and chiral bases in superspace, and covariant derivatives and invariant integration measures are constructed in chiral bases. The group structure of chiral representations of OSp(1.4) is studied in detail. The simplest linear OSp(1.4)-invariant models are presented: the OSp(1.4)-analog of the Wess-Zumino model and OSp(1.4)-extension of the Yang-Mills theory. The relation of the described formalism to supergravity is also discussed. (Atomindex citation 11:506306)

JINR-E-2-12390 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Special Relativistic Two-Body Problem. 1. Past.
G. N. Afanas'ev, and R. A. Asanov. 1979, 11p
U.S. Sales Only.

The Poincare method is applied to the consideration of the two-body problem within the Special Relativity. The formulation of the theory contains two arbitrary functions of the Lorentz invariants. A specific choice of these functions leads to the correct description of three crucial experiments of the General Relativity. The expansion in the inverse powers of the light velocity being performed, the approximate Lorentz covariant two-body equations without retardation effects are obtained. (Atomindex citation 11:506193)

JINR-E-2-12511 PC **A03**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Gravitational Axial Superfield and the Formalism of Differential Geometry.
V. I. Ogievetsky, and E. S. Sokatchev. 1979, 27p
U.S. Sales Only.

The formalism of differential geometry in the physical 4+4-dimensional superspace (SS) is developed on the basis of the simplest supergravity group of general transformations of the coordinates of the left and right chiral SS. In this formalism the only independent dynamical variable is the axial gravitational superfield (SF). All the geometrical objects - supertetrades, affinities, etc. - are expressed in terms of the axial gravitational SF. Analysis of the transformation properties of the spinor-coordinate derivatives has led to a natural definition of the local Lorentz group for SF. The simplest Lagrangian for pure supergravity is discussed. (Atomindex citation 11:506364)

JINR-R-2-11338 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
Connection Between the Spin Magnetic Moment of an Electron and the Dirac Monopole.
Ya. Ruzhichka. 1978, 4p
In Russian.
U.S. Sales Only.

It is shown that the magnetic charge of an electron is a value which characterizes not the particle itself but components of its internal structure: a magnetic moment, radius and spin. The spin magnetic moment of an electron is presented as a magnetic moment of an elementary magnetic dipole consisting of Dirac magnetic charges of opposite signs placed at the distance which is equal to electron classic radius. (Atomindex citation 10:488718)

JINR-R-2-12232 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Comparative Investigation of the Stability of One-Dimensional and Spherical Symmetric Solitons of the Scalar Field with Self-Interaction Jsub(Mu)Jsup(Mu).
I. L. Bogolyubskii. 1979, 16p
In Russian.
U.S. Sales Only.

The variational method has been employed to investigate the dynamical stability of solitons of the complex scalar field with the self interaction Jsub(mu)Jsup(mu). The classes of probe functions are proposed which conserve the charge of solitary scalar field lumps. The analytical consideration is completed by results of numerical solution by means of computer of nonstationary nonlinear partial differential equation. The spherically symmetric solitons in this model turn out to be unstable for all alpha omega alpha < 1 unlike the one-dimensional ones, which are apparently stable for all alpha omega alpha < 1. The eigenvalue problem has been formulated to find the instability growth rate in the linear approximation in this model. (Atomindex citation 10:492395)

NORDITA-78-19 PC **A02**/MF **A01**
Nordisk Inst. for Teoretisk Atomfysik, Copenhagen (Denmark).
Quantization of the Axial Current for the Massless Rarita-Schwinger Field.
N. K. Nielsen. Jun 78, 22p
U.S. Sales Only.

The chiral charge of the extra ghost needed for the quantization of the massless Rarita-Schwinger field is shown to have the opposite sign of that of the other ghosts and of the Rarita-Schwinger field itself. The effects on the quantum level of the gauge-noninvariance of the classical axial current are discussed. (Atomindex citation 10:477659)

PB82-140625
(Order as PB82-140575, PC **A05**/MF **A01**)
National Bureau of Standards, Washington, DC. National Engineering Lab.

Upper Limits for the Number of Bound States Associated with the Yukawa Potential,
Herbert S. Bennett. 23 Jul 80, 6p
Included in Jnl. of Research of the National Bureau of Standards, v86 n5 p503-508, Sep-Oct 81.

The number of bound-state solutions of the Schrodinger equation for the screened Coulomb potential (Yukawa potential), --(C/r) exp(-alpha r), occurs frequently in theoretical discussions concerning, for example, gas discharges, nuclear physics, and semiconductor physics. The number of bound states is a function of (C/alpha). Three upper limits for the number of bound states associated with the Yukawa potential are evaluated and compared. These three limits are those given by Bargmann, Schwinger, and Lieb. In addition, the Sobolev inequality states that whenever (C/alpha) less than 1.65 no bound state occurs. This agrees to within a few percent of the numerical calculations of Bonch-Bruevich and Glasko. The Bargmann and Lieb limits and the Sobolev inequality are substantially easier to evaluate than the Schwinger limit. Among the three limits, the Schwinger limit gives the most restrictive limit for the existence of only one bound state and, therefore, is the best one to use for the approach to no binding, i.e., 1.65 less than (C/alpha) less than or equal to 1.98. The Lieb limit is the best among the three when (C/alpha) is greater than 1.98. The Bargmann limit is the least restrictive.

20K. Solid Mechanics

AD-A107 074/7 PC **A03**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Bethesda, MD.
The Dynamic Design-Analysis Method (DDAM) in NASTRAN.
Final rept. Jun-Nov 80,
Myles M. Hurwitz. Oct 81, 26p Rept no. DTNSRDC-81/073

This report describes the theory, implementation, and use of the Dynamic Design-Analysis Method (DDAM) in the NASTRAN finite element structural analysis computer program. DDAM is the procedure used in the shock design of shipboard equipment. Since such equipment is also frequently analyzed with NASTRAN, the inclusion of DDAM in NASTRAN greatly enhances the efficiency of the design-analysis process. (Author)

AD-A107 238/8 PC **A03**/MF **A01**
Washington Univ., Seattle. Dept. of Mechanical Engineering.
Dynamic Crack Curving - A Photoelastic Evaluation.
Technical rept.,
M. Ramulu, and A. S. Kobayashi. Oct 81, 32p Rept no. TR-41
Contract N00014-76-C-0060

The objective of the present study is to derive a dynamic crack curving criterion applicable to both mode I and combined modes I and II crack tip deformation. To this goal, dynamic extension of two static crack curving criteria, that is the maximum circumferential stress criterion and the minimum strain energy density criterion at a critical distance rc, was considered. The developed theoretical relations were evaluated numerically and crack velocity on crack curving direction were deduced. Crack curving angles predicted by the two dynamic crack curing criteria were then compared with experimental results, obtained from past dynamic photoelastic investigation.

AD-A107 459/0 PC **A02**/MF **A01**
New York Univ., NY. Courant Inst. of Mathematical Sciences.
Research in Continuum Mechanics.
Final rept. 1 Apr 76-31 May 81,
Fritz John. 1 Nov 81, 5p
Contract N00014-76-C-0301

F. John worked on two different topics during the period covered by the contract. The first one concerned the formation of singularities in nonlinear waves in several dimensions; the other one algebraic constraints implied by hyperbolicity of systems of partial differential equations with constant coefficients.

AD-A107 534/0 PC **A06**/MF **A01**
Illinois Univ. at Urbana-Champaign. Dept. of Aeronautical and Astronautical Engineering.
Automatic Input Data Generation for ADINA and NASTRAN Structural Computer Codes.
Contract rept. Jan 80-Feb 81,
Adam R. Zak. Oct 81, 109p ARBRL-CR-00472
Contract DAAK11-78-C-0116

An existing structural finite element code SANX was modified to generate two new programs, ADIGEN and NASGEN. The SANX program is a three-dimensional code designed for approximate structural analysis of cylindrical configurations with deviations from axial symmetry. The input procedure for SANX is relatively simple and is similar to the procedure of two-dimensional axi-symmetric codes. The function of codes ADIGEN and NASGEN is to use the input data for SANX and internally generate input data for general three-dimensional codes ADINA and NASTRAN respectively. Numerical examples are given which illustrate the use of the programs ADIGEN and NASGEN and the resulting saving of effort in developing data for ADINA and NASGEN.

N82-11390/3 PC **A07**/MF **A01**
SHD Associates, Inc., Evanston, IL.
Surface-Tension Induced Instabilities: Effects of Lateral Boundaries.
Final Report.
S. Rosenblat, S. H. Davis, and G. M. Hornsy. Jun 81, 130p NASA-CR-165530
Contract NAS3-22274

Convection in circular and rectangular cylinders is analyzed. The governing equations and boundary conditions are formulated, linear and nonlinear stability theory are considered, and the physical implications of the theory are discussed.

N82-11488/5 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
An Improved Transverse Shear Deformation Theory for Laminated Antisotropic Plates.
M. V. V. Murthy. Nov 81, 39p NASA-TP-1903, L-14533

An improved transverse shear deformation theory for laminated anisotropic plates under bending is presented. The theory eliminates the need for an arbitrarily chosen shear correction factor. For a general laminate with coupled bending and stretching, the constitutive equations connecting resultants with average displacements and rotations are derived. Simplified forms of these relations are also obtained for the special case of a symmetric laminate with uncoupled bending. The governing equation for this special case is obtained as a sixth-order equation for the normal displacement requiring prescription of the three physically natural bounday conditions along each edge. For the limiting case of isotropy, the present theory reduces to an improved version of Mindlin's theory. Numerical results are obtained from the present theory for an example of a laminated plate under cylindrical bending. Comparison with results from exact three-dimensional analysis shows that the present theory is more accurate than other theories of equivalent order.

N82-11489/3 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Research in Nonlinear Structural and Solid Mechanics.
H. G. Mccomb, Jr., and A. K. Noor. Jun 81, 44p
NASA-CP-2147-Sup, L-13950
Presented at Symp. Held at Washington, D.C., 6-8 Oct. 1980; Sponsored by George Washington Univ., NSF, American Society of Civil Engineers and Asme.

Recent and projected advances in applied mechanics, numerical analysis, computer hardware and engineering software, and their impact on modeling and solution techniques in nonlinear structural and solid mechanics are discussed. The fields covered are rapidly changing and are strongly impacted by current and projected advances in computer hardware. To foster effective development of the technology perceptions on computing systems and nonlinear analysis software systems are presented.

N82-11490/1 PC **A03**/MF **A01**
Texas Univ. at Arlington. Center for Aeronautical Research.
Modal Analysis Using a Fourier Analyzer, Curve-Fitting, and Modal Tuning.
R. R. Craig, Jr., and Y. T. Chung. 1 Oct 81, 41p
NASA-CR-161886, CAR-81-1
Contract NAS8-33980

The proposed modal test program differs from single-input methods in that preliminary data may be acquired using multiple inputs, and modal tuning procedures may be employed to define closely spaced frquency modes more accurately or to make use of frequency response functions (FRF's) which are based on several input locations. In some respects the proposed modal test proram resembles earlier sine-sweep and sine-dwell testing in that broadband FRF's are acquired using several input locations, and tuning is employed to refine the modal parameter estimates. The major tasks performed in the proposed modal test program are outlined. Data acquisition and FFT processing, curve fitting, and modal tuning phases are described and examples are given to illustrate and evaluate them.

PB82-132697 PC **A03**/MF **A01**
Instituut TNO voor Bouwmaterialen en Bouwconstructies, Delft (Netherlands).
Collapse Analysis of Three Dimensional Assemblages of Eccentrically Stiffened Hot Rolled Steel Plates and Shallow Shells,
R. S. Puthli. 1980, 49p
Pub. in HERON, v25 n2 1980.

This paper describes a finite element formulation of the large-deflection, elasto-plastic behavior of eccentrically stiffened steel plated assemblages in more than one plane. The theory is based on a lagrangian formulation for moderately large deflections, using rectangular plate elements and stiffener line elements that may be given initial deformations and slopes to form shallow shells. Plasticity in the plate is treated using Ilyushin's yield criterion, whereas a simple uniaxial yield criterion is adopted for the stiffeners. Torsional stiffness of the stiffeners is treated in a linear-elastic manner and torsional instability (stiffener tripping) is not considered. A computer program (CASPA) has been developed for the analysis. Classical, numerical and experimental examples are compared with numerical solutions obtained from computer analyses. The numerical solutions commence with geometric imperfections at zero load, with an incremental approach up to collapse.

20L. Solid-State Physics

AD-A106 855/0 Not available NTIS
Illinois Univ. at Urbana-Champaign. Coordinated Science Lab.
Theoretical and Experimental Investigation of the Dynamics of Pulsed Laser Annealing of Amorphous Silicon,
Anjan Bhattacharyya, B. G. Streetman, and K. Hess. 9 Jun 80, 8p ARO-16849.1-EL
Contracts DAAG29-80-C-0011, N00014-79-C-0424
Availability: Pub. in Jnl. of Applied Physics, v52 n5 p3611-3617 May 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A106 907/9 Not available NTIS
Illinois Univ. at Urbana-Champaign.
Time Dependence of Current at High Electric Fields in Al(x)Ga(1-x)As-GaAs Heterojunction Layers,
M. Keever, T. Drummond, K. Hess, H. Morkoc, and B. G. Streetman. 4 Dec 80, 3p ARO-16849.11-EL
Contract DAAG29-80-C-0011
Availability: Pub. in Electronics Letters, v17 n2 p93-94, 22 Jan 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A106 911/1 PC **A02**/MF **A01**
Colorado State Univ., Fort Collins. Dept. of Electrical Engineering.
Charge Instabilities in Lateral Super-Lattices under Conditions of Population Inversion.
Technical rept.,
D. K. Ferry. 30 Jan 81, 10p Rept no. CSU-TR-N-81-7
Contract N00014-78-C-0124
Pub. in Physica Status Solidi, v106 p63-71 1981.

No abstract available.

AD-A106 966/5 PC **A02**/MF **A01**
Pennsylvania Univ., Philadelphia.
Inter-Soliton Electron Hopping Transport in Trans-(CH)x.
Technical rept.,
D. Moses, J. Chen, A. Denenstein, M. Kaveh, and T.-C. Chung. 30 Jul 81, 8p Rept no. TR-81-8
Contract N00014-81-K-0648
Pub. in Solid State Communications, v39 p1-4 1981.

No abstract available.

AD-A106 982/2 PC **A02**/MF **A01**
South Carolina Univ., Columbia. Dept. of Mathematics and Statistics.
Stability and Growth Estimates for Electric Fields in Nonconducting Dielectrics with Memory.
Final rept. 1 Jul 77-30 Apr 81,
Frederick Bloom. 1 Aug 81, 6p AFOSR-TR-81-0706
Grant AFOSR-77-3396

The report is of a mathematical study of electromagnetic phenomena associated with nonlinear dielectrics having memory. Definite details are available in the scientific papers produced and in the SIAM monograph, 'Ill-posed Problems for Integrodifferential Equations in Mechanics and Electromagnetic Theory,' SIAM Studies in Applied Mathematics, August 1981. The basic thrust of the work has been the derivation of stability and growth estimates (in suitable function space norms) for both electric fields and electric induction fields in nonconducting dielectrics with memory. (Author)

AD-A106 990/5 PC **A02**/MF **A01**
Air Force Wright Aeronautical Labs., Wright-Patterson AFB, OH.
Trap Studies on GaAs-Si3N4 Interfaces.
Interim rept. Jun 80-Apr 81,
Fritz L. Schuermeyer, and H. P. Singh. 17 Feb 81, 10p Rept no. AFWAL-TR-81-1238
Pub. in Jnl. of Vacuum Science and Technology, v19 n3 p421-426 Sep/Oct 81.

No abstract available.

AD-A107 064/8 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
Surface and Defect Excitations in Covalently Bonded Solids.
Progress rept.,
John D. Joannopoulos, and Estelle M. Kunoff. 1980, 5p
Contract N00014-77-C-0132
Pub. in RLE Progress Report No. 123, Section III, p11-12 Jan 81.

No abstract available.

AD-A107 120/8 PC **A02**/MF **A01**
Colorado State Univ., Fort Collins.
Hot-Carrier Microwave Conductivity in the Non-Zero Collision Duration Regime.
Technical rept.,
P. Das, D. K. Ferry, and H. Grubin. 23 Oct 80, 4p
Rept no. CSU-TR-N-81-5
Contract N00014-78-C-0124
Pub. in Solid State Communications, v38 n6 p537-539 1981. Prepared in cooperation with Rensselaer Polytechnic Inst., Troy, NY and United Technologies Research Center, East Hartford, CT.

No abstract available.

AD-A107 121/6 PC **A02**/MF **A01**
Colorado State Univ., Fort Collins.
Effects of a Thin SiO2 Layer on the Formation of Metal-Silicon Contacts.
Technical rept.,
S. M. Goodnick, M. Fathipour, D. L. Ellsworth, and C. W. Wilmsen. 18 Sep 80, 8p Rept no. CSU-TR-N-81-6
Contract N00014-78-C-0124
Pub. in Vacuum Science and Technology, v18 n3 p949-954 Apr 81.

No abstract available.

AD-A107 155/4 Not available NTIS
IBM Thomas J. Watson Research Center, Yorktown Heights, NY.
Spatial Separation of Carriers in InAs-GaSb Superlattices,
L. L. Chang, G. A. Sai-Halasz, L. Esaki, and R. L. Aggarwal. 18 Feb 81, 4p ARO-15229.21-P
Contract DAAG29-78-C-0007
Availability: Pub. in Jnl. of Vacuum Science and Technology, v19 n3 p589-591 Sep-Oct 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 386/5 PC **A02**/MF **A01**
University of Southern California, Los Angeles.
Impact Ionization and Hot Carrier Transport in Semiconductors.
Final rept. 1 Aug 77-1 Oct 80,
C. R. Crowell. Oct 81, 9p ARO-15295.2-EL
Grant DAAG29-77-G-0202

The major emphasis has been on an experimental study of impact ionization in Pt/nGaAs and Pt/pInP <100> Schottky barrier and developing the theoretical background necessary to interpret the measurements. The intention here was to establish the Schottky barrier as a configuration which would permit more reliable measurements of impact ionization coefficients than p-n junction configurations. (Author)

DE82000148 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Magnetic Susceptibility of Curium Pnictides.
S. E. Nave, P. G. Huray, J. R. Peterson, D. A. Damien, and R. G. Haire. Sep 81, 2p CONF-810809-18
Contract W-7405-ENG-26
16. international conference on low temperature physics, Los Angeles, CA, USA, 19 Aug 1981.

The magnetic susceptibility of microgram quantities of exp 248 CmP and exp 248 CmSb has been determined with the use of a SQUID micromagnetic susceptometer over the temperature range 4.2 to 340 K and in the applied magnetic field range of 0.45 to 1600 G. The fcc (NaCl-type) samples yield magnetic transitions at 73K and 162 K for the phosphide and antimonide, respectively. Together with published magnetic data for CmN and CmAs, these results indicate spatially extended exchange interactions between the relatively localized 5f electrons of the metallic actinide atoms. (ERA citation 06:035182)

LA-7910 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
ESCADT: A FORTRAN Code for Computing the Positions and Areas of X-Ray Photoelectron Spectral Peaks.
L. E. Cox. Sep 79, 22p
Contract W-7405-ENG-36

Program ESCADT uses least-squares-derived convoluting numbers to smooth and differentiate x-ray photoelectron spectra. Peak maxima are located by finding zero crossings of the first derivative and refined using a cubic polynomial fitting procedure. Background points are located using the product of the absolute value of the first derivative and the smoothed ordinate value. Peak areas, using both linear and scattered electron backgrounds, are computed. Spectra are corrected for changes in instrument sensitivity and energy calibration with gold-standard data retrieved from a disk file. Five determinations of the gold 4f peak positions yielded standard deviations of 0.011 and 0.031 eV for the 4f/sub 7/2/ and 4f/sub 5/2/ peaks, respectively. The relative standard deviation for the computed areas was 0.85%. (ERA citation 05:003417)

LA-8446-PR PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
LASL Nb sub 3 Ge Conductor Development. Fifteenth Quarterly Progress Report, January 1-March 31, 1980.
M. P. Maley. 1980, 17p
Contract W-7405-ENG-36

The fifteenth quarterly progress report of the Los Alamos Scientific Laboratory program to develop Nb sub 3 Ge as a superconductor with potential applications to power transmission lines covers the period January 1-March 31, 1980. During this quarter, additional instrumentation was installed on the first 1-m Nb sub 3 Ge cable in preparation for tests, which are now scheduled for May 1980. Three Nb sub 3 (Ge/sub 1-x/Ga/sub x/)pseudobinary compounds were prepared with compositions approaching the proper stoichiometry and with x = 0.08, 0.12, and 0.15, respectively. The replacement of germanium by gallium causes a slight depression (approx. 1.0 K) of T/sub c/ and does not appear to influence H/sub c sub 2 / significantly. A microscopic examination of the edge material on sections of our Nb sub 3 Ge-clad tape revealed longitudinal cracks extending along the edges of tapes with Nb sub 3 Ge thickness t greater than or equal to 4.0 mu m. Tapes with t = 3.0 mu m show no evidence of such cracks, corroborating conclusions reached by ac loss measurements. The two layers of the inner conductor of the first 1-m test cable were wound with tapes coated with 4 to 6 mu m of Nb sub 3 Ge and are expected to contain longitudinal cracks. The two layers of the outer conductor of this coaxial cable were fabricated from tapes coated with approx. 3.0 mu m of Nb sub 3 Ge and should exhibit lower ac losses. (ERA citation 05:034379)

PB82-131665 PC **A02**/MF **A01**
Science and Engineering Research Council, Chilton (England). Rutherford and Appleton Labs.
Low-Temperature Theories of the Classical One-Dimensional Easy-Plane Ferromagnet: Successes and Limitations,
J. M. Loveluck, T. Schneider, E. Stoll, and J. R. Jauslin. c1981, 23p RL-81-072
Prepared in cooperation with IBM Zurich Research Lab. (Switzerland).

Computer simulation results for the dynamic-structure factors of a ferromagnetically-coupled, classical one-dimensional easy-plane spin system are compared with calculations based on a linear spin-wave theory, for the case where a magnetic field is applied in the easy plane. The case of zero-applied field is also considered, and here the results are compared with the low-temperature theory of Cieplak and Sjolander.

PB82-134149 PC **A02**/MF **A01**
Science and Engineering Research Council, Chilton (England). Rutherford and Appleton Labs.
Spin-Wave Damping in the Quantum Ising-Heisenberg Chain,
S. W. Lovesey. c1981, 9p RL-81-073

Spin-wave interactions in an anisotropic Heisenberg magnet, subject to an external field, are studied in terms of the corresponding Dyson-Maleev boson Hamiltonian. The self-energy for transverse spin fluctuations is calculated completely in the limit of low temperatures, and the spin-wave damping and shift are obtained in analytic form for all wavevectors for a one-dimensional system. (Copyright (c) Science and Engineering Research Council 1981.)

PB82-135864 PC **A02**/MF **A01**
Florida Univ., Gainesville. Dept. of Electrical Engineering.
Conductivity Mobility, Hall Mobility, and Resistivity in p-Type Silicon.
Final rept. 11 Mar 77-10 Jun 80,
Sheng S. Li. Sep 81, 9p NBS-GCR-81-334
Contract NB79-SBCA-0168, ARPA Order-2397

Detailed theoretical and experimental studies of the dopant density, hole density, hole mobility, and resistivity in p-type silicon were carried out over a wide range of dopant density (10 to the 14th power to 3 x 10 to the 18th power/cc) and temperature (100 to 400K). Good agreement between theory and experiment was obtained, and the theoretical models appear to be adequate for interpreting the temperature and dopant density dependence of resistivity of boron-, gallium-, and indium-doped silicon over the ranges studied.

PB82-137365 Not available NTIS
National Bureau of Standards, Washington, DC.
New Generating Functions and Results for the Density Polynomials of the Lattice Gas.
Final rept.,
P. Esfandiari, Paul H. E. Meijer, R. A. Farrell, and S. Favin. Aug 81, 14p
Sponsored in part by Office of Naval Research, Arlington, VA.
Pub. in Physical Review B 24, n3 p1298-1311, 1 Aug 81.

This paper determines the density weight factors needed to evaluate the Helmholtz free energy for the Ising model of the lattice gas through tenth order in the coupling constants for arbitrary density and interactions. This is accomplished by developing new generating functions for the evaluation of the density factors that are associated with the articulated vertices which result from summing over the 'hard-core' part of the interaction potential. Application to the nearest neighbor model reproduces known results for the simple cubic (s.c.) and body-centered cubic (b.c.c.) lattices,

and extends the known face-centered cubic (f.c.c.) results by two orders.

20N. Wave Propagation

AD-A107 039/0 PC **A05**/MF **A01**
Rome Air Development Center, Griffiss AFB, NY.
Propagation Study for a Tropospheric Transhorizon Radar.
Technical rept.,
Kurt Toman. Jun 81, 83p Rept no. RADC-TR-81-166

Computation methods for tropospheric propagation losses in transhorizon propagation are used to provide estimates for the detectability of over-the-horizon targets. Losses depend on frequency, distance, climate, refractivity, and on an empirically derived attenuation function which also takes into account the effects of antenna heights. Equivalent antenna temperatures are assumed to be due to galactic noise. Receiver noise is characterized by noise figure F. Signal-to-noise ratios are illustrated for several target cross-sections as a function of frequency and distance, parametric in antenna heights, distance or frequency, for the median loss 50%, as well as 1, 10, 90, and 99% levels of variability. (Author)

AD-A107 097/8 PC **A07**/MF **A01**
Naval Ocean Systems Center, San Diego, CA.
Accuracy of High Frequency Maximum Usable Frequencies (MUF) Prediction.
Final rept. Sep 79-Jan 81,
D. B. Sailors, W. K. Moision, and R. P. Brown. 15 Sep 81, 132p Rept no. NOSC/TR-695

The residuals between observed oblique sounder medium maximum observed frequencies (MOF) and predicted maximum usable frequencies (MUF) were used to assess the accuracy of high frequency MUF prediction. 4668 MOF's measured on 25 paths were compared against the predicted values from ITSA-1, HFMUFES 4 and MINIMUF-3.5. The data was screened into subsets to see the effect of particular paths, path length and orientation, season, month, latitude, sunspot number, diurnal trends, geographic region and sounder type. MINIMUF-3.5 was most accurate, having a bias of 0.08 MHz (0.6 percent) and a root mean square (rms) error of 3.71 MHz (3.6 percent). It was least accurate during the sunrise and sunset transition hours and for path lengths 5000 to 7000 km. Linear regression analysis identified the probable source of this error to be in the M factor calculation. Except for land paths the performance of HFMUFES 4 was disappointing. It was least accurate for paths over the ocean and with lengths between 4000 and 5000 km. Linear regression analysis identified the source of this error to be a bias in the foF2 numerical coefficient map over ocean areas. The 'k sec Phi'. factor accentuated this bias as the range increased. The version of ITSA-1 with ionospheric characteristics mapped in universal time appeared to be slightly more accurate than the one with its characteristics mapped in local time. All of the programs had difficulty predicting MUFs accurately at high latitude. (Author)

AD-A107 429/3 PC **A04**/MF **A01**
Army Electronics Research and Development Command, White Sands Missile Range, NM. Atmospheric Sciences Lab.
Effect of Hail, Snow, and Melting Hydrometeors on Millimeter Radio Waves.
Final rept.,
Herbert K. Kobayashi. Jul 81, 54p Rept no. ERADCOM/ASL-TR-0092
Errata sheet inserted.

This report is a short survey intended to present the effect of solid and melting hydrometeors on millimeter radio waves. Hail and sleet were found to be more amenable to theoretical calculation and laboratory experimentation than snow because of their simpler approximations of particle shape and dielectric constant. However, field measurements on hail and sleet are scarce in comparison to snow. The most pressing need was found to be the gathering of reliable field data on the morphology and size distribution of hydrometeor particles, particularly those in a melting state where the effect on millimeter waves may exceed that of rain. These data are needed to more closely relate experimental measurement to theoretical calculation. (Author)

AD-A107 517/5 PC **A06**/MF **A01**
Naval Ocean Systems Center, San Diego, CA.
A Program to Compute ELF/VLF Earth-Ionosphere Modal Height Gains via WKB Methods up to Satellite Altitudes.
Interim rept. Feb-Sep 81,
R. A. Pappert, and L. R. Hitney. Sep 81, 116p Rept no. NOSC/TR-724

This report presents a variation of an earlier program for computing earth-ionosphere waveguide modal height gains. In particular, WKB formalism developed by Budden is used to speed up calculation of height gains in the ionosphere up to satellite altitudes. All quantities needed to calculate mode sums at those altitudes for all field components produced by sub-ionospheric electric dipole sources can be generated with the present program. (Author)

AD-A107 521/7 PC **A03**/MF **A01**
Syracuse Univ., NY. Dept. of Electrical and Computer Engineering.
Electromagnetic Transmission through a Rectangular Aperture in a Perfectly Conducting Plane.
Interim rept.,
Joseph R. Mautz, and Roger F. Harrington. Feb 76, 49p SCIENTIFIC-10, AFCRL-TR-76-0056
Contract F19628-73-C-0047

A computer program is developed for calculations the transmission characteristics of a rectangular aperture in a perfectly conducting plane excited by an incident plane wave. The solution is obtained from the integral equation for the equivalent magnetic current using the method of moments. The expansion functions and testing functions are pulses in the direction transverse to current flow, and triangles in the direction of current flow. Quantities computed are the equivalent magnetic current and the transmission cross section patterns. To illustrate the solution, computations are given for narrow slots and for square apertures. The computer program is described and listed with sample input-output data. (Author)

N82-11338/2 PC **A04**/MF **A01**
Systems and Applied Sciences Corp., Riverdale, MD.
Antenna Pattern Modification for Single Reflector Antennas.
Final Report.
A. S. Milman. Jan 81, 51p NASA-CR-166711
Contract NAS5-25993

The problem of correcting the antenna temperatures observed with a single reflector is addressed from two viewpoints with emphasis on decreasing the level of the side lobes without greatly amplifying the noise. One viewpoint is that of matrix operations where the elements of the matrix are integrals of the antenna pattern. This formulation is directly applicable to developing algorithms. The other is that of an analysis of the problem by treating the antenna as a spatial filter and using Fourier transforms of the antenna pattern. This approach leads to an understanding of the problem, but is not suitable for performing calculations. The method developed can be used to correct data from mechanically-scanned microwave instruments that view Earth from space.

21.

PROPULSION AND FUELS

21B. Combustion and Ignition

AD-A107 029/1 PC **A05**/MF **A01**
United Technologies Research Center, East Hartford, CT.
Investigation of Combustion Process Using Fiber Optics.
Final technical rept. 14 May 80-14 May 81,
William W. Morey. 14 Jun 81, 85p Rept no. UTRC/R81-925172-4
Contract N00019-80-C-0331

This technical report describes the results of a 12-month program to design, build, and test a fiber optic viewing device (fiberscope) on a high pressure gas turbine combustor rig. High speed motion picture photography along with video tapings were made of the combustor flame with the fiberscope. With the high speed photography the turbulent flame motion could be followed in some detail. Visible wavelength spectra were taken of the flame emission through the fiberscope and analysis indicates that a mean flame temperature can be measured. The fluctuation frequency spectrum of the flame was also observed with a fast fourier transform analyzer, and the possibility of coupling with acoustic resonances was indicated. In addition, the fuel spray was illuminated with laser light from the fiberscope probe and contour plots were made of a sequence of frames from the movie film. The combustor viewing probe may be used as an important aid in future combustion design and to help determine causes of various failure modes of combustor liners. (Author)

AD-A107 163/8 Not available NTIS
Cornell Univ., Ithaca, NY.
Burning Rate Maximum of a Plane Premixed Flame,
G. S. S. Ludford, and A. K. Sen. 1981, 12p ARO-15882.30-M
Contract DAAG29-79-C-0121
Presented at the ICOGER (7th) Goettingen (Germany, F.R.), 20-24 Aug 79. Prepared in cooperation with Northwestern Univ., Evanston, IL.
Availability: Pub. in Combustion in Reactive Systems, v76 p427-436 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 256/0 PC **A11**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Engineering.
An Investigation of Flame Stability in a Coaxial Dump Combustor.
Doctoral thesis,
Edward T. Curran. 18 May 79, 243p AFIT/AE/DS79-1, AFIT-CI-79-215D

An experimental investigation of the flame stability characteristics of a coaxial dump combustion chamber was made. A 6-in. diameter combustor was studied, and the dump plane inlet diameter was varied from 2.5 in. to 5.0 inches Tests were carried out using premixed ethylene/air and JP-4/air. To avoid vitiation effects, a clean-air heater was used to vary the temperature of the inlet air. The temperature levels were generally in the range 1000-1250 R; the corresponding inlet pressure was varied between approximately 10 and 40 psia. Inlet Mach numbers were typically in the range 0.2 to 0.9. The flame stability data were not collapsed by a conventional dump combustor correlation. However, a correlating parameter was derived by modelling the annular recirculation zone as an adiabatic stirred reactor using a one-step chemical reaction. This derived correlating parameter was used to obtain successful correlations. Some tests were performed with additional fuel injection directly into the recirculation zone. Lean extinction limits were determined with varying fractions of the total fuel flow being injected into the recirculation zone. These tests yielded an estimate of the air mass flow fraction entrained into the recirculation zone. Finally, tests were performed using a transparent quartz combustor; it was observed that the combustion process was an oscillatory phenomenon with the reaction zone moving rapidly to and fro along the combustor. A comprehensive review of the literature concerning the flame stability and aerodynamics of coaxial dump combustors was presented.

DE81029479 PC **A02**/MF **A01**
Clarkson Coll. of Technology, Potsdam, NY.
Final Report on Grant No. DE-FG21-78ET13383.
J. L. Katz. 16p DOE/ET/13383-T1
Contract FG21-78ET13383

Slag vaporization is a serious problem in high-temperature coal combustion and gasification processes. As the combustion or gasification gases cool on passage through process equipment, the slag will recondense, often with very deleterious effects. For example, in gasification processes even small concentration of slag vapors can result in poisoning of catalysts and fouling

of heat exchanger tubes. The ultimate goal of this research program is to create an apparatus capable of studying the nucleation of the products found in high temperature coal gasification and combustion. Since real coal combustion is a very complicated process with many reaction species, an experimental design was chosen which will allow successively more complicated reactant streams to be used, yet which at every stage are quite realistic approximation to real processes. A multiported flat flame burner, was constructed for the study. Preliminary nucleation studies are described. (ERA citation 06:034275)

DE81030391 PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Dept. of Mechanical Engineering.
Coal Combustion in High Convective Flows. Progress Report, March 1, 1981-August 31, 1981.
K. W. Ragland. 8 Sep 81, 6p DOE/PC/30213-T1
Contract FG22-80PC30213

Fundamental data on ignition delay, volatile burn time, volatile reactivity, char burn time, char reactivity, aerodynamic drag, particle surface temperature, and internal porosity of burning coal particles are being obtained as a function of coal type, particle size, gas temperature, gas velocity and oxygen concentration. Simulation of conditions inside a furnace has been achieved in two tests rigs which have been constructed. In the first rig single coal particles 3 to 12 mm in diameter are suspended on a 0.02 mm diameter stainless steel wire which extends from an electronic balance into a 50 mm dia. tube containing flowing electrically heated gas. This setup extends the traditional thermogravimetric analysis to flowing systems. In the second rig coal particles are levitated freely in a 50 mm diam, diverging insulated quartz nozzle. To date 16 fixed particle test runs have been made-7 with a Kentucky bituminous coal, 3 with a Montana sub-bituminous and 6 with a Texas lignite. Gas temperatures ranged from 760 to 1140 exp 0 K, flow rates from 2 to 11 scfm, gas-particle velocities from 1.8 to 10.4 m/s, and Reynolds Numbers from 100 to 1150. The reactivity of the coal particles during devolatilization and char burn was calculated from the slope of the mass versus time curve and using the initial external surface areas. For the levitated particle tests the reactivity can be calculated from the CO sub 2 and CO curves. The results of the reactivity calculations to date are summarized. The reactivity data will be used to develop a theory of coal combustion which includes mass transfer and kinetic effects. (ERA citation 06:034271)

DE81030860 PC **A03**/MF **A01**
Energy and Environmental Research Corp., Santa Ana, CA.
Assessment of Pulverized-Coal-Fired Combustor Performance. Third Quarterly Technical Progress Report, April 1, 1981-June 30, 1981.
W. Richter, W. Clark, and R. Payne. Jul 81, 28p
DOE/PC/30297-T4
Contract AC22-80PC30297

This program is concerned with the provision of a technology base to expedite the conversion of industrial processes from oil and gas to coal and other pulverized fuels. It addresses primarily the impact of fuel type on the thermal performance of a combustor. The program incorporates two experimental tasks and is constructed around an analytical task (Task 1) which will identify and upgrade a family of computer programs required to undertake thermal performance analysis studies. These analytical tools will thus be used to predict the effects of parameters such as fuel type and furnace variables on combustor performance, and to identify those properties which have a major impact on thermal performance. The second task uses a combustion reactor to screen the key variable identified in Task I and to provide data on the properties of coal particulate matter which affect heat transfer performance. Verification of the engineering analytical approach will be provided by measurements made in a pilot-scale furnace in the third task. Progress is reported. (ERA citation 06:035358)

DE82000122 PC **A02**/MF **A01**
Combustion Engineering, Inc., Windsor, CT.
Industrial Coal-Fired Fluidized-Bed Demonstration Program. Progress Report, April 30-May 1, 1980.
J. I. Accortt, J. R. Comparato, and W. R. Norcross.
1980, 20p CONF-8004173-1
Contract AC21-76ET10389
19. annual Kentucky industrial coal conference, Lexington, KY, USA, 30 Apr 1980.

Progress in the construction, now 35% complete, of an industrial fluidized bed steam generating plant being built at the US Navy Great Lakes Training Facility in Illinois is reported. This plant will provide a practical demonstration of the use of fluidized bed technology in an industrial coal fired application. It has been designed making use of the valuable data and experience gained from the operation and testing of the subscale fluidized bed boiler. The construction and shakedown are scheduled to be completed later this year and the formal test program to begin in 1981. The information to be provided from the test series will allow industry to assess the capabilities of fluidized bed combustion under meaningful operation conditions. (ERA citation 06:035355)

DE82000419 PC **A04**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Catalytic Combustion with Incompletely Vaporized Residual Fuel.
T. J. Rosfjord. Mar 81, 67p DOE/NASA/0152-1, NASA-CR-16516
Contract AI01-77ET10350

An experimental program directed toward demonstrating efficient catalytic combustion of fuel-lean mixtures of residual fuel and air, and assessing the influence of incomplete fuel vaporization on the performance of a catalytic reactor has been conducted. A fuel injection system was designed to provide uniform catalytic reactor inlet properties and a controllable level of fuel vaporization. The reactor was a graded-cell device constructed from Corning MCB-12, zirconia-spinel substrate. The elements were catalyzed with a UOP noble metal, proprietary catalyst. The fuel preparation and catalytic reactor components were used in tests with No. 6 oil, No. 2 oil or blends of residual fuel (No. 6 oil or shale residual oil) and No. 2 oil. The several tests performed with No. 6 oil indicated that complete vaporization of the fuel would be required to achieve satisfactory catalytic operation. Tests were performed with blends of either No. 6 and No. 2 oil, or a shale residual oil and No. 2 in an attempt to determine a threshold level of the heavy constituent for satisfactory combustor operation. The results suggested that no level of No. 6 oil was conducive to satisfactory performance unless complete vaporization was achieved. Shale oil blends were identified which resulted in stable operation without bursts of luminous particles exiting the reactor. This fuel differed from the No. 6 oil by having a lower temperature final distillation point; that is, it did not contain the high molecular weight species contained in the No. 6 oil. Tests performed with the shale oil blends indicated that the combustor performance was sensitive to the degree of fuel vaporization. A similar effect was observed in tests performed with No. 2 oil. (ERA citation 06:034294)

DOE/ET/15167-191 PC **A10**/MF **A01**
Aerojet Energy Conversion Co., Sacramento, CA.
High-Temperature-Staged Fluidized-Bed Combustion (HITS), Bench Scale Experimental Test Program Conducted During 1980. Final Report.
R. E. Anderson, D. M. Jassowski, R. A. Newton, and M. L. Rudnicki. Apr 81, 204p
Contract AC21-79ET15167

An experimental program was conducted to evaluate the process feasibility of the first stage of the HITS two-stage coal combustion system. Tests were run in a small (12-in. ID) fluidized bed facility at the Energy Engineering Laboratory, Aerojet Energy Conversion Company, Sacramento, California. The first stage reactor was run with low (0.70%) and high (4.06%) sulfur coals with ash fusion temperatures of 2450 exp 0 and 2220 exp 0 F, respectively. Limestone was used to scavenge the sulfur. The produced low-Btu gas was burned in a combustor. Bed temperature and inlet gas percent oxygen were varied in the course of testing. Key results are summarized as follows: the process was stable and readily controllable, and generated a free-flowing char product using coals with low (2220 exp 0 F) and high (2450 exp 0 F) ash fusion temperatures at bed temperatures of at least 1700 exp 0 and 1800 exp 0 F, respectively; the gaseous product was found to have a total heating value of about 120 Btu/SCF at 1350 exp 0 F, and the practicality of cleaning the hot product gas and delivering it to the combustor was demonstrated; sulfur capture efficiencies above 80% were demonstrated for both low and high sulfur coals with a calcium/sulfur mole ratio of approximately two; gasification rates of about 5,000 SCF/ft exp 2 -hr were obtained for coal input rates ranging from 40 to 135 lbm/hr, as required to maintain the desired bed temperatures; and the gaseous product yielded combustion temperatures in excess of 3000 exp 0 F when burned with preheated (900 exp 0 F) air. The above test results support the promise of the HITS system to provide a practical means of converting high sulfur coal to a clean gas for industrial applications. Sulfur capture, gas heating value, and gas production rate are all in the range required for an effective system. Planning is underway for additional testing of the system in the 12-in. fluid bed facility, including demonstration of the second stage char burnup reactor. (ERA citation 06:035356)

N82-11397/8 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Lewis Research Center's Coal-Fired, Pressurized, Fluidized-Bed Reactor Test Facility.
J. A. Kobak, and R. J. Rollbuhler. Oct 81, 35p NASA-TM-81616, E-621

A 200-kilowatt-thermal, pressurized, fluidized-bed (PFB) reactor, research test facility was designed, constructed, and operated as part of a NASA-funded project to assess and evaluate the effect of PFB hot-gas effluent on aircraft turbine engine materials that might have applications in stationary-power-plant turbogenerators. Some of the techniques and components developed for this PFB system are described. One of the more important items was the development of a two-in-one, gas-solids separator that removed 95+ percent of the solids in 1600 F to 1900 F gases. Another was a coal and sorbent feed and mixing system for injecting the fuel into the pressurized combustor. Also important were the controls and data-acquisition systems that enabled one person to operate the entire facility. The solid, liquid, and gas sub-systems all had problems that were solved over the 2-year operating time of the facility, which culminated in a 400-hour, hot-gas, turbine test.

ORNL-MIT-213 PC **A04**/MF **A01**
Massachusetts Inst. of Tech., Oak Ridge, TN. School of Chemical Engineering Practice.
Cocurrent Three-Phase Fluidized Bed. Part 2.
G. M. Burck, K. Kodama, R. G. Markeloff, and S. R. Wilson. 19 May 75, 66p
Contract W-7405-ENG-26

Operating characteristics and gas-liquid mass transfer have been examined in a cocurrent three-phase fluidized bed using an air-carbon dioxide gas mixture, water, and three packings. Minimum fluidization velocities were determined, but correlation of the volume fraction of each phase with packing characteristics was only successful for the solids due to scatter in the data. Several improvements are suggested. The concentration profile for 4 x 8 mesh alumina beads approximated a plug flow model, and the K/sub L/a was about twice that for 0.25-in. Plexiglas spheres whose profile approached a CSTR model. The K/sub L/a and the degree of dispersion for a bubble column at similar flow conditions were between values found for the columns containing alumina and Plexiglas packings. (ERA citation 05:032698)

21D. Fuels

AD-A106 859/2 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
FERC Should Improve the Natural Gas Well Determination Process.
30 Jul 81, 27p Rept no. GAO/EMD-81-88

This report contains recommendations to you on page 18. As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with agency's first request for appropriations made more than 60 days after the date of the report. (Author)

AD-A106 883/2 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Unresolved Issues Resulting from Changes in DOE's Synthetic Fuels Commercialization Programs.
17 Aug 81, 14p Rept no. GAO/EMD-81-128
See also Rept. no. GAO/EMD-81-36.

On June 30, 1980, with the passage of the Energy Security Act, the Congress authorized a substantial financial and planning assistance program designed to spur development of alternatives to imported oil. As part of this effort, the Congress intended to accelerate the development of synthetic fuels in the United States. In an effort to achieve a 'fast start' the act authorized an interim program, which is being implemented using existing Federal departments, particularly DOE, while awaiting the establishment of the Synthetic Fuels Corporation (SFC). The interim program at DOE was funded at over $5.5 billion. This funding is broken down as follows: $3 billion for incentives to develop synthetic fuels for defense needs (Defense Production Act). Incentives would be in the form of loan guarantees, purchase commitments, and price guarantees; $2 billion for incentives to produce synthetic fuels from oil shale, tar sands, coal-oil mixtures, coal, and hydrogen production by electrolysis (Federal Nonnuclear Energy Research and Development Act). Incentives were available in the form of loan guarantees, purchase commitments, and price guarantees; and $.5 billion for synthetic fuel feasibility studies and cooperative agreements. Feasibility study grants are intended to accelerate assessment of the technical and economic feasibility of proposed commercial synthetic fuel plants by funding such efforts as preliminary designs and environmental monitoring and analysis.

AD-A106 920/2 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Synthetic Fuels Corporation's Management of Demonstration Projects Would Be Limited.
10 Jul 81, 33p Rept no. GAO/EMD-81-116

Department of Energy management and technical direction of fossil fuel demonstration projects differ substantially from that contemplated by Synthetic Fuels Corporation officials. Under requirements of the Energy Security Act of 1980, the Synthetic Fuels Corporation cannot have any direct role in the construction or operation of a demonstration project. Although the Corporation can participate in management decisions, primary management responsibility must be given to the private sponsor of the project. While DOE would use over 100 staff members for monitoring and direction, the Corporation may only have one full-time employee devoted to the project relying more heavily on the sponsor's management and control system. (Author)

AD-A106 923/6 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Status of Strategic Petroleum Reserve Activities--July 1981.
17 Jul 81, 16p Rept no. GAO/EMD-81-118

This report discusses the status of SPR storage facilities and the Government's activities to contract for SPR oil as of July 10, 1981. It is based on our review of DOE and Defense Fuel Supply Center (DFSC) SPR program documents, and of publications and studies related to the program. We also interviewed officials in DOE and DFSC. We did not verify the available capacity of SPR storage facilities nor the volume of oil received by DOE. (Author)

AD-A107 042/4 PC **A02**/MF **A01**
Georgetown Univ., Washington, DC. Dept. of Chemistry.
Fractionation of Diesel Fuel from Petroleum and Paraho Shale Oils.
Final rept.,
Charles F. Hammer. Oct 81, 22p DTNSRDC/SME-80/212
Contract N00167-76-M-8549

A fractionation scheme has been developed to separate diesel fuels into neutral water solubles, acidic components, basic components, saturated hydrocarbons, substituted benzenes, polycyclic aromatic hydrocarbons, and polar neutrals. A sample of conventional petroleum diesel fuel and a sample of diesel fuel derived from Paraho crude shale oil by the Gary-Western process were fractionated by this procedure. Each fraction was further analyzed by gas chromatography and proton magnetic resonance spectroscopy. The petroleum sample was found to contain 17.5% total aromatics of which 9.5% were polycyclic aromatic hydrocarbons compounds. However, the Paraho-Gray Western shale oil fuel contained about twice as much total aromatics (38.2%) and polycyclic aromatic hydrocarbons compounds (19.3%). The total acyclic hydrocarbon straight chain compounds content was 66.7% for the petroleum sample and 59,3% for the Paraho-Gary Western shale sample. Suggestions for further work are also made. (Author)

AD-A107 132/3 PC **A04**/MF **A01**
Construction Engineering Research Lab. (Army), Champaign, IL.
Overview of Considerations in Assessing the Biomass Potential of Army Installations.
Final rept.,
Robert S. Baran, W. D. Severinghaus, D. J. Hunt, and H. E. Balbach. Aug 81, 70p Rept no. CERL-TR-N-108

This report provides Army installations an overview of necessary considerations for evaluating the feasibility of using forest resources (biomass) as an alternative source of fuel, identifies state-of-the-art land management techniques needed for biomass harvest and management, and provides a comprehensive annotated bibliography on biomass materials. The report focuses on: (1) procedures for evaluating biomass availability, (2) techniques of harvesting biomass, (3) the feasibility of military development of energy plantations, (4) the economic feasibility of using biomass, (5) managerial and legal constraints, and (6) ecological and silvicultural implications of biomass use. (Author)

AD-A107 136/4 PC **A04**/MF **A01**
Southwest Research Inst., San Antonio, TX. Army Fuels and Lubricants Research Lab.
Effects of Alcohol Fuels on Engine Wear.
Interim rept. Sep 76-Sep 80,
E. C. Owens, H. W. Marbach, Jr., E. A. Frame, and T. W. Ryan, III. Oct 80, 63p Rept no. AFLRL-133
Contracts DAAK70-79-C-0175, DAAK70-78-C-0001

Research into the effects of alcohol on engine lubrication and wear has investigated four alcohol-containing fuels; pure methanol, pure ethanol, methanol in unleaded gasoline, and ethanol, in unleaded gasoline. This research work has indicated that during low-temperature engine operations such as winter commuter service and warmup, use of pure methanol may result in increased engine wear. This increased wear appears to be primarily a low-temperature problem. With the engine warmed to normal operating temperatures, this increased wear has not been observed. To this point, the research with ethanol-containing fuels has not detected any wear increases. This may be due to the short duration engine tests being conducted, but nevertheless indicates that increased wear should be of less concern with this fuel. Wear mechanism studies have indicated that corrosive attack within the piston ring and cylinder area by alcohol combustion byproducts is partially responsible for the increased wear. Investigation of alcohol and lubricant compatibility and physical removal of the lubricant films by liquid alcohol have provided additional insights into these wear phenomena. (Author)

AD-A107 184/4 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
The United States Synthetic Fuels Corporation's Project Selection Guidelines Need Clarification.
5 Aug 81, 5p Rept no. GAO/EMD-81-129

The SFC's (Synthetic Fuel Corporation) project selection guidelines provide information on the process for evaluating proposals, the criteria to be used, and their relationship to the requirements of the Energy Security Act. It appears that the guidelines are consistent with the requirements of the Energy Security Act. However, in reviewing the public comments, we found that probably the principal criticism is that they are vague. There is concern that industry sponsors may not have enough guidance to adequately prepare their proposals. Also, the Environmental Protection Agency and environmental groups would like the environmental groups would like the environmental criteria to be clearer and more complete. Our comments similarly concern areas in need of clarification. We found that the SFC needs to clarify the project selection process by describing in greater detail how projects will be reviewed and by establishing a target date for beginning the review of 'mature' projects. The SFC also needs to clarify how economic assumptions, such as inflation rates, interest rates, and the price of oil and gas, will be standardized so that the financial viability of a project can be assessed and compared with other projects. Furthermore, to ensure the integrity of the project selection process, the SFC needs to maintain detailed documentation at each level of the process.

AD-A107 196/8 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Status of Strategic Petroleum Reserve Activities--October 1980.
Monthly rept. no. 2, 5 Sep-17 Oct 80.
3 Nov 80, 11p Rept no. GAO/EMD-81-24

This is the second in a series of monthly reports requested by certain members of the Senate Committee on Energy and Natural Resources and the House Committee on Interstate and Foreign Commerce on the administration's activities to implement title VIII of the Energy Security Act. This second report discusses the administration's activities taken between September 5, 1980, and October 17, 1980, to fill the SPR. Enclosure I presents additional details on the results of the August 1980 competitive exchange of SPR oil, deliveries made to the SPR, the readiness of SPR facilities to accept oil, and the administration's efforts to increase the SPR fill rate beyond 100,000 barrels per day. This report is based on interviews with officials in DOE, the Defense Fuel Supply Center, and the Office of Management and Budget, and on publications, studies, and DOE and Defense Fuel Supply Center program documents related to SPR.

AD-A107 373/3 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Status of Strategic Petroleum Reserve Activities.
19 Jun 81, 17p Rept no. GAO/EMD-81-107

This is the sixth in a series of status reports requested by members of the Senate Committee on Energy and Natural Resources and the House Committee on Energy and Commerce on the administration's activities to implement title VIII of the Energy Security Act. (See enc. II for the July 23, 1980, letter requesting these reviews.) Title VIII requires the President to resume filling the Strategic Petroleum Reserve (SPR) at an average rate of at least 100,000 barrels per day for fiscal year 1981 and succeeding years. Our most recent report on the status of SPR fill activities (EMD-81-85, May 4, 1981) noted that, since passage of the Energy Security Act, the Government had issued contracts for about 75 million barrels of oil to be delivered to the SPR during fiscal year 1981. This is equivalent to an average fill rate of about 205,000 barrels per day for the entire fiscal year. However, on April 24, 1981, the Department of Energy (DOE) postponed purchases of additional oil for the SPR for about 30 days because it hoped to take advantage of expected decreases in crude oil prices during the period.

DE81029028 PC **A11**/MF **A01**
United Technologies Corp., Windsor Locks, CT. Hamilton Standard Div.
Design, Construction, and Operation of a Full Scale Experimental Anaerobic Fermentation Facility. Final Report.
Jun 81, 235p DOE/ET/20009-T1
Contract AC01-77ET20009

Under DOE Contract No. EG-77-C-4015, the Hamilton Standard Division of United Technologies Corporation has designed, constructed and operated a 25 ton per day anaerobic fermentation facility to evaluate the technical and economic viability of producing fuel gas and an animal refeed product from the residues of an environmental beef cattle feedlot. The system was built at a feedlot owned by Kaplan Industries Inc. (KII) in Bartow, Florida. KII contributed the site for system construction, the cattle to provide manure as system feedstock, certain capital equipment and the labor, utilities and supplies for the system operation. Florida Power Corporation contributed a 440 kW grid-connected engine/generator system. After operating conditions were reached during the summer of 1979, the system has been in continuous operation and has been producing between 3 to 5 cubic feet of methane per pound of volatile solids fed to the system. Product gas has been successfully utilized in: the system process boiler which maintains thermophilic operating tem-

perature in the fermentors; a meat packing plant process boiler, cofired with fuel oil; and a 440 kW grid-connected engine/generator system. Although the feeding trials that will establish the value of the dewatered effluent have been performed, the final results are not yet available. Initial operation of the system indicates that it will be a technically and economically viable process. (ERA citation 06:034517)

DE81030236 PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Experimental Work Related to Two Bismuth Sulfate Cycles and Their Possible Improvement. Outline of a Possible Antimonyl Sulfate Cycle with Separate Evolution of Sulfur Dioxide and Oxygen.
W. M. Jones. 1981, 10p LA-UR-81-2627, CONF-810942-4
Contract W-7405-ENG-36
International Energy Agency Annex I workshop on thermochemical hydrogen, Julich, F.R. Germany, 23 Sep 1981.

Two bismuth sulfate cycles are made possible by the stepwise decomposition of the sulfate-oxysulfate system. Omitting statement of the steps for decomposition of SO sub 3 and the electrochemical formation of H sub 2 and H sub 2 SO sub 4 from SO sub 2 and H sub 2 O, the key reactions are: Cycle I - Bi sub 2 (SO sub 4) sub 3 = Bi sub 2 O sub 2 sub 3 (SO sub 4) sub 0 sub 7 + 2.3 SO sub 3 ; Bi sub 2 O sub 2 sub 3 (SO sub 4) sub 0 sub 7 + 2.3 H sub 2 SO sub 4 = Bi sub 2 (SO sub 4) sub 3 + 2.3 H sub 2 O; Cycle II - Bi sub 2 O(SO sub 4) sub 2 = Bi sub 2 O sub 2 sub 3 (SO sub 4) sub 0 sub 7 + 1.3 SO sub 3 ; Bi sub 2 O sub 2 sub 3 (SO sub 4) sub 0 sub 7 + 1.3 H sub 2 SO sub 4 = Bi sub 2 O(SO sub 4) sub 2 + 1.3 H sub 2 O. Cycle I proceeds through the intermediate oxysulfates Bi sub 2 O(SO sub 4) sub 2 and Bi sub 2 O sub 2 SO sub 4 and Cycle II through Bi sub 2 O sub 2 SO sub 4 . Cycle I has the advantage of generating 2.3 moles of H sub 2 per mole of Bi sub 2 O sub 3 , compared with 1.3 for Cycle II. Published work on the Bi sub 2 O sub 3 -SO sub 3 -H sub 2 O system shows that Bi sub 2 (SO sub 4) sub 3 is the stable solid in contact with H sub 2 SO sub 4 solutions above 52.7 wt%, so that acid of at least this strength would have to be used in Cycle I. Concentrations between about 3 wt% and 52.7 wt% could be used for Cycle II. The efficiency for electrochemical formation of H sub 2 SO sub 4 and H sub 2 seems at present to be a maximum at around 30 wt% H sub 2 SO sub 4 . Some thermodynamic data obtained for the decomposition reactions are presented. A possible improvement in these cycles is also discussed which may provide a solution to a problem of sorption of H sub 2 SO sub 4 solution by the solids and might allow use of a more dilute acid than in Cycle I above. A brief discussion on the possible simplification of the SO sub 3 -SO sub 2 -O sub 2 separation problem with a sulfuric acid-antimonyl sulfate hybrid cycle is presented. The principal reactions are: (1) Sb sub 2 O sub 2 SO sub 4 = Sb sub 2 O sub 4 + SO sub 2 at 900 K; (2) Sb sub 2 O sub 4 = Sb sub 2 O sub 3 + 1/2 O sub 2 at 1300 K; (3) Sb sub 2 O sub 3 + H sub 2 SO sub 4 = Sb sub 2 O sub 2 SO sub 4 + H sub 2 O. (ERA citation 06:034413)

DE81030363 PC **A03**/MF **A01**
Oklahoma Univ., Norman. School of Chemical Engineering and Materials Science.
Development of a Thermodynamic Properties Correlation Framework for the Coal Conversion Industry. Phase IA. Annual Report, September 1, 1980-August 31, 1981.
K. E. Starling, L. L. Lee, and K. H. Kumar. 1981, 33p DOE/PC/30249-T2
Contract FG22-80PC30249

A three-parameter corresponding states framework developed originally for light hydrocarbons has been modified to rapidly develop a practical thermodynamic properties prediction capability for the coal conversion industry. The three-parameter corresponding states correlation is shown to accurately describe the thermodynamic behavior of pure non-polar and slightly polar non-associating coal fluids and mixtures for which the mixture constituents are known. Characterization techniques are outlined for converting distillation analysis of undefined mixtures (with composition available in terms of broad fractions) into representative pseudo-components. Empirical correlations have been developed to estimate the three correlations have been developed to esitmate the three corresponding states characterization parameters for each fraction from measurements made on the fraction (boiling point, specific gravity, molecular weight). Extension of the three-parameter corresponding states framework to a multiparameter framework to predict the thermodynamic behavior of polar and associating pure coal fluids is presently being persued. Interim results for one and two ring polar and associating coal fluids indicate that an extension of the corresponding states methodology to associating fluids using a five-parameter correlation is possible. (ERA citation 06:034235)

DE81030379 PC **A04**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Coal Liquefaction Research, October 1, 1978-September 30, 1981.
H. Heinemann. Sep 81, 51p LBL-13238
Contracts W-7405-ENG-48, FG22-78ET1143

Progress reports are presented for the following two areas: catalytic cracking studies with water-wet silica-alumina catalysts; and Fischer-Tropsch reactor studies where similarities and differences between fixed bed and slurry type reactors are investigated and further experiments conducted to measure mass transfer coefficients and reaction kinetics which are to be used in a model slurry reactor. The following are some of the conclusions. (1) The premise that the presence of liquid water might increase catalytic cracking activity was found to be invalid. It was demonstrated that cracking can occur at previously unobserved low temperatures (though at low conversions) and that an anomaly exists in that one of the catalysts tested shows an entirely different cracking behavior and probably follows a different cracking mechanism. (2) the diameter of a fixed-bed Fischer-Tropsch reactor critically affected the resistance of the reactor to plugging caused by the build up of carbonaceous or waxy deposits. Plugging was very likely due to local nonuniformity in the catalyst temperature. Decreasing the reactor diameter at a fixed gas space velocity, should improve temperature uniformity by decreasing the length of the thermal conduction path and increasing the extent of convective heat transfer from each catalyst particle. Suppression of plugging at higher H sub 2 /CO ratios is likely due to a reduction in the product average molecular weight and the reaction with hydrogen of carbon deposited via the Boudouard reaction. A slurry bed reactor with its much greater isothermicity can be expected to behave similarly to very small diameter fixed bed reactors and therefore have a higher tolerance of lower H sub 2 /CO ratio feed gas. (ERA citation 06:034218)

DE82000098 PC **A04**/MF **A01**
Argonne National Lab., IL.
Waste-to-Energy Systems Institutional Barriers Assessment Workshop.
Jun 81, 57p ANL/CNSV-TM-78
Contract W-31-109-ENG-38

An outline of the format for conducting the workshop is presented as well as information resulting from the workshop. A list of attendees, discussion groups, and a find list of barriers are included. (ERA citation 06:035096)

DE82000104 PC **A02**/MF **A01**
Argonne National Lab., IL.
Ethanol Production Via Fungal Decomposition and Fermentation of Biomass. Phase II. Semiannual Progress Report, October 1980-March 1981.
A. A. Antonopoulos, and E. G. Wene. Mar 81, 21p ANL/EES-TM-148
Contract W-31-109-ENG-38

A literature review reveals that Fusarium strains decompose cellulose, hemicelluloses, and lignin, as well as ferment five- and six-carbon sugars to ethanol. During the first part of Phase II (first half of FY 1981) in this program, research efforts focused mainly on continuing the: (a) isolating, culturing, and maintaining of Fusarium strains for biochemical evaluation; (b) screening for potentially cellulolytic F. strains; (c) searching for lignolytic and hemicellulolytic F. strains; (d) screening for effective pentose- and hexose-fermenting F. strains; and (e) evaluating various methods and materials for the optimization of certain fermentation parameters. Approximately 200 additional Fusarium isolates were isolated and screened; all showed cellulolytic activity, with 50 showing increased activity. Several isolates that formed fusoid to spheroid spores and cells on xylan media were observed to retain their morphology in cellulose suspensions. All tested isolates were found to ferment glucose to ethanol; some yielded amounts of ethanol approaching those produced by yeast. In screening more than 600 isolates for xylose fermentation, 25 were identified as effective fermenters. Reutilization of inoculum during consecutive fermentations was employed to facilitate higher ethanol yields from xylose. A few Fusarium isolates indicated relatively high ethanol tolerability. (ERA citation 06:034437)

DE82000243 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Behavior of Alkali Metal-Acid Phosphates During Elevated Temperature Water Electrolysis.
M. Steinbugler. 19 Aug 81, 14p UCID-19192
Contract W-7405-ENG-48

We are exploring the use of molten salts containing water as electrolytes for the high temperature (approx. 300 to 400 exp 0 C) electrolysis of water as part of a research program on Thermochemical Cycles for the Production of Hydrogen. The purpose of this study is to determine the behavior of the phosphate-based electrolytes KH sub 5 (PO sub 4) sub 2 , LiH sub 5 (PO sub 4) sub 2 , and NaH sub 5 (PO sub 4) sub 2 , during electrolysis. We are most interested in their characteristics as a function of temperature, the degree of dehydration, and effects of neutralizing cations. We observed the behavior of these molten salts while measuring the cell potential as a function of time at constant current densities up to 1 A/cm exp 2 using platinum electrodes. We also monitored the cell resistance before and after polarization in order to correlate the electrolyte conductivity to the degree of dehydration. Our experiments demonstrated several important characteristics of the electrolytes. Perhaps the most obvious characteristic is the tendency to dehydrate in an open container. This loss of water increases the potential for any given current and temperature for each electrolyte. It does so primarily be increasing the resistance of the electrolyte. This dehydration effect was most pronounced in the sodium- and lithium-based electrolytes, with the potassium-based electrolytes showing a relatively slow dehydration rate. However, the resistances for the sodium-based electrolytes were generally lower than for the potassium-based electrolytes when the water content was high. The lowest cell potentials were obtained for the sodium-based electrolyte at 300 and 350 exp 0 C. However, any conclusions based on our cell potential measurements are of limited value at this time due to the qualitative nature of our experiments especially in regard to the uncertainties in water contents of the melts. (ERA citation 06:034414)

DE82000244 PC **A04**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Analysis and Leak Tests of Wells for New Solution Mined Caverns at the Bryan Mound DOE-SPR Storage Site.
K. L. Goin. Apr 81, 60p SAND-81-0978
Contract AC04-76DP00789

An analysis is presented of factors inportant to leak tests of wells to be used in developing solution mined caverns in salt domes. Results of leak tests of 30 wells are presented. Leak rates of 26 of the wells met the DOE leak rate criterion of no more than 100 barrels per year per cavern. (ERA citation 06:034291)

DE82000452 PC **A03**/MF **A01**
Mid-American Solar Energy Complex, Minneapolis, MN.
Interactive Model to Assess Economics of Anaerobic Digestion on the Farm.
Aug 81, 41p MASEC/R-81-068, B-102-3
Contract AC02-79CS30150

This interactive computer model was designed to provide economic assessment for on-the-farm anaerobic digestion systems. The model is accessed as part of the MASEC Models Library, a general purpose modeling framework. It consists of two phases: engineering analysis and economic analysis. User inputs are stored in a data base and may be retained for future use. Model outputs include a recap of user inputs, calculations for gas production, digester heat requirements, system revenues, yearly cash flow, and a graph of the net present value of the investment. The model is generalized so that non-farm applications may also be analyzed. The economic assessment can be prepared for individuals, corporations, and non-profit organizations. The program will work equally well for various digester designs such as continuously stirred reactors, plug-flow systems, and fluidized-bed columns. The program accepts inputs and displays results in English units. (ERA citation 06:034427)

DE82000461 PC **A03**/MF **A01**
Mid-American Solar Energy Complex, Minneapolis, MN.
MASEC Industrial Fuel-Wood Program.
M. Hohmann. Jul 81, 46p MASEC-R-81-062, B-101-3
Contract AC02-79CS30150

The MASEC Industrial Fuel Wood Program is designed not only to identify technical and institutional barriers to the use of wood for fuel, but to effectively reduce these barriers and the economic uncertainty they cause by providing business and industry with the type of information they need for preliminary planning purposes. This report is designed to provide information on resource availability, the types of equipment needed, sources of technical assistance, and the financial aspects of the potential investment. A listing of existing wood-fired systems is also included. A key component of the Industrial Fuel Wood Program is a net-cash-flow analysis based upon a life-cycle economic model that is used to evaluate new and retrofit wood-fired boiler installations. The model is currently set up to evaluate wood and/or oil-fired boilers and to provide comparisons of the two. The Industrial Fuel Wood Program relies heavily on widespread access to this computer software. (ERA citation 06:034485)

DE82000468 PC **A16**/MF **A01**
Alabama Univ. in Huntsville. Kenneth E. Johnson Environmental and Energy Center.
Utility Rate Guide for SOLCOST Data Bank Cities.
D. L. Christensen, and S. B. Weir. May 80, 354p
DOE/CS/30013-T4
Contract FG01-79CS30013

A listing of residential utility rates for cities included in the SOLCOST Data Bank is presented. The format shows the residential rates for electricity and natural gas for each city and shows company name, customer and minimum charges, fuel adjustment, taxes, and surcharges. The date of currency is also shown. Rate structures for each company are shown as quoted by that company. Computations have been made for each step showing the total without charges and taxes, the total with charges and taxes, the cost per kWh or CCF, and the cost per million Btu with charges and taxes. Maps depicting costs per million Btu are included in Appendix A. These costs are averages of those cities researched and may not represent a true average of the entire state. The averages are shown without taxes. They are shown both for basic rates and rates adjusted for extra charges and fuel adjustments. Appendix B shows rankings by cost for each region. The map and cost rankings have been drawn from the regional documents. (ERA citation 06:034941)

DE82000483 PC **A12**/MF **A01**
Alabama Univ. in Huntsville. Kenneth E. Johnson Environmental and Energy Center.
Rate Guide for Residential No. 2 Heating Oil and Coal for SOLCOST Data Bank Cities.
D. L. Christensen, and S. B. Weir. Dec 80, 251p
DOE/CS/30013-T3
Contract FG01-79CS30013

A preliminary listing of residential No. 2 heating oil and coal prices for cities included in the SOLCOST Data Bank is presented. The list shows the name of one company chosen at random in each city. Rates of companies in the same city are relatively the same, therefore, only one company is represented. The name is shown so as not to misrepresent any other companies. The information shown represents the data as quoted by each company. This includes the basic rate, the taxes, and the delivery charge, if not included. The minimum represents the minimum amount sold to any one customer. Computations have been made to show cost per gallon of fuel oil, cost per ton of coal, cost for both commodities with taxes, and cost-per-million Btu. Taxes are calculated on the basic rate and does not add the delivery charge where it is not included. The Btu values used in converting to cost-per-million Btu are 136,000 Btu per gallon of fuel oil number two and 25,070 Btu for coal. These values will vary from city to city. (ERA citation 06:034940)

DE82000505 PC **A17**/MF **A01**
Oak Ridge National Lab., TN.
Fossil Energy Program. Quarterly Progress Report for the Period Ending June 30, 1981.
L. E. McNeese. Sep 81, 378p ORNL-5802
Contract W-7405-ENG-26

This quarterly report covers the progress made during the period April 1 through June 30 for the Oak Ridge National Laboratory research and development projects that are carried out in support of the increased utilization of coal and other fossil fuels as sources of clean energy. These projects are supported by various parts of DOE including Fossil Energy, Basic Energy Sciences, Office of Health and Environmental Research, Office of Environmental Compliance and Overview, Economic Regulatory Administration, Policy and Evaluation, Resource Applications, by the Electric Power Research Institute, and by the Tennessee Valley Authority and the EPA Office of Research and Development through interagency agreements with the DOE. (ERA citation 06:034204)

DE82000808 PC **A11**/MF **A01**
Systems Technology Corp., Xenia, OH.
Conversion of Municipal Solid Waste to Energy, Jacksonville, Florida, Phase I Report.
Jul 81, 237p DOE/CS/20231-1
Contract AC01-79CS0231

The concept feasibility study reported herein was sponsored by the US Department of Energy's (DOE) Urban Waste and Municipal Systems Branch. It is an objective of this Branch to assist in the development of new technology and tc foster the commercialization of innovative concepts for energy recovery from municipal solid waste (MSW). Thus the DOE sponsored a program to evaluate and implement the Scientific Energy Engineering (SEE) auger combustion system. The system is a two chamber, starved-air incinerator so named because of the auger located within the primary chamber which tumbles and moves the waste through the system. A 250 tons per day (TPD) prototype facility located in Jacksonville, Florida, was tested and evaluated. The test report is included in its entirety as an attachment to this study. The commercial version of the system, with a capacity of 350 TPD, was developed by Boeing Engineering and Construction Company (BEC) which is licensed to design and market the system for SEE. The evaluation of applying resource recovery in the City of Jacksonville, Florida, involved the determination of the following: (1) the amount and characteristics of the solid waste; (2) the location and requirement of candidate energy customers and materials markets; (3) the applicable incineration/heat recovery and resource recovery technologies; and (4) the institutional, legal, and environmental requirements for constructing a facility. An implementation plan was developed to define the specific steps required to employ a waste-to-energy technology in the Jacksonville area. (ERA citation 06:034482)

IITRI-M-6043-6(QTPR) PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Design, Engineering and Evaluation of Refractory Liners for Slagging Gasifiers. Sixth Quarterly Technical Progress Report, No. M6043-6(QTPR).
R. F. Firestone, C. Hales, and M. J. Greaves. Apr 80, 37p
Contract AC05-78OR13410

Considerable research is required to establish optimum refractory system and design methods for slagging coal gasifiers. This program is a first attempt at the required research. While there have been a number of programs to test refractories for slagging gasifiers, there have been none which have tested more than a few small specimens of each refractory or closely simulated gasifier conditions. On this program, approximately 40 cu ft (over 600 9 in straight equivalents) of refractory will be tested during each run in the environment of a typical slagging gasifier. By testing this large amount of refractory, material variations are averaged out and a closer approximation to liners for large gasifiers is achieved. In addition, cooling system performance can be studied. (ERA citation 05:026782)

LA-UR-80-2400 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
LASL Thermochemical Hydrogen Program Status on September 30, 1980.
K. E. Cox, C. L. Peterson, W. M. Jones, and M. G. Bowman. 1980, 5p CONF-801047-1
Contract W-7405-ENG-36
Annual contractors review meeting for the Department of Energy's Office of Advanced Conservation Technologies, Washington, DC, USA, 13 Oct 1980.

The work described here was accomplished during the period October 1, 1979-September 30, 1980. Highlights of the experimental program were: a solids decomposition facility was constructed and used to study the handling of bismuth oxysulfates and the kinetics of their decomposition; and the results of our kiln experiments showed that a substantial amount of bismuth oxysulfate decomposition occurs with residence times under 2 min. at temperatures between 973 and 1143 exp 0 K. The LASL bismuth sulfate sub-cycle thus appears a candidate for hydrogen production utilizing a solar heat source. In the evaluation phase of our work, the technoeconomics of the hybrid sulfur cycle were determined and compared with several published results as well as compared to the technoeconomics for water electrolysis processes for hydrogen production. We aided the efforts of the Department of Energy (DOE) Thermochemical Cycle Evaluation Panel in reviewing the Lawrence Livermore Laboratory (LLL) zinc selenide cycle as well as the General Atomic (GA) sulfur-iodine cycle. (ERA citation 05:033355)

MLM-2731(OP) PC **A02**/MF **A01**
Mound Facility, Miamisburg, OH.
Princetown I Data Analysis.
A. K. Agarwal, R. E. Zielinski, and P. W. Seabaugh. 1980, 14p CONF-800716-2
Contract AC04-76DP00053
Underground coal conversion symposium, Afton, OK, USA, 13 Jul 1980.

An underground coal gasification (UCG) field test in bituminous coal was successfully completed near Princetown, West Virginia. This test was performed by US DOE's Morgantown Energy Technology Center with Mound Facility providing the major instrumental and field crew support. The primary objective of this field test was to determine the viability of the Linked Vertical Well (LVW) technology to recover the 900 foot (275 m) deep, 6 foot (2 m) thick coal seam. A methane rich product gas with an average heating value greater than 200 BTU/SCF (7452 KJ/m exp 3) was produced at low air injection flow rates during the initial phase of the test. This high methane content has been attributed to the nature of the bituminous coal which has a very high volatile matter content. The methane formation can be accounted for by thermal and hydrocracking of tars and oils along with hydropyrolysis and hydrogasification of coal char. The high heating value of the gas was the combined effect of residence time, flow pattern, injection flow rate, injection pressure and backpressure. Thermocouple data have been used to speculate on the path development and the effects of conduction and convection model on the test system. During the gasification phase, a gas with an average heating value of approximately 124 Btu/SCF (4620 KJ/m exp 3) was produced which resulted in an average estimated energy production of 510.9MM Btu/day. (ERA citation 05:025171)

N82-11223/6 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Technical and Economic Aspects of Hydrogen Storage in Metal Hydrides.
R. Schmitt. Sep 81, 44p NASA-TM-76610
Contract NASW-3198
Transl. Into English from Proc. Of the Intern. Workshop on Hydrogen and Its Perspectives, V. 1, Liege, 1976 p 1-48. Original Language Document Was Announced as A78-18842. Transl. By Scientific Translation Service, Santa Barbara, Calif. Original DOC. Prep. By Battelle Memorial Inst., Geneva. Presented at the Intern. Workshop on Hydrogen and Its Perspectives, Liege, 15-18 Nov. 1976.

The recovery of hydrogen from such metal hydrides as LiH, MgH2, TiH2, CaH2 and FeTiH compounds is studied, with the aim of evaluating the viability of the technique for the storage of hydrogen fuel. The pressure-temperature dependence of the reactions, enthalpies of formation, the kinetics of the hydrogen absorption and desorption, and the mechanical and chemical stability of the metal hydrides are taken into account in the evaluation. Economic aspects are considered. Development of portable metal hydride hydrogen storage reservoirs is also mentioned.

N82-11224/4 PC **A04**/MF **A01**
Lockheed-California Co., Burbank.
Experimental Study of Fuel Heating at Low Temperatures in a Wing Tank Model, Volume 1.
Final Report.
F. J. Stockemer. Aug 81, 75p NASA-CR-165391, LR-29935-V-1
Contract NAS3-21977

Scale model fuel heating systems for use with aviation hydrocarbon fuel at low temperatures were investigated. The effectiveness of the heating systems in providing flowability and pumpability at extreme low temperature when some freezing of the fuel would otherwise occur is evaluated. The test tank simulated a section of an outer wing tank, and was chilled on the upper and lower surfaces. Turbine engine lubricating oil was heated, and recirculating fuel transferred the heat. Fuels included: a commercial Jet A; an intermediate freeze point distillate; a higher freeze point distillate blended according to Experimental Referee Broadened Specification guidelines; and a higher freeze point paraffinic distillate used in a preceding investigation. Each fuel was chilled to selected temperature to evaluate unpumpable solid formation (holdup). Tests simulating extreme cold weather flight, without heating, provided baseline fuel holdup data. Heating and recirculating fuel increased bulk temperature significantly; it had a relativley small effect on temperature near the bottom of the tank. Methods which increased penetration of heated fuel into the lower boundary layer improved the capability for reducing holdup.

N82-11225/1 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
The Storage of Hydrogen in the Form of Metal Hydrides: An Application to Thermal Engines.
C. Gales, and P. Perroud. Aug 81, 39p NASA-TM-76609
Contract NASW-3199
Transl. Into English from Proceedings of the Assoc. Des Ingr. Electriciens Sortis de l'Inst. Electrotech. Montefiore, Belgium, V. 1, 1977 p 1-34. Original Language Document Was Announced as A78-18845. Transl. By Kanner (Leo) Associates, Redwood City, Calif. Conf. Held at Liege, Belgium, 15-18 Nov. 1976.

The possibility of using LaNi56, FeTiH2, or MgH2 as metal hydride storage sytems for hydrogen fueled automobile engines is discussed. Magnesium copper and magnesium nickel hydrides studies indicate that they provide more stable storage systems than pure magnesium hydrides. Several test engines employing hydrogen fuel have been developed: a single cylinder motor originally designed for use with air gasoline mixture; a four-cylinder engine modified to run on an air hydrogen mixture; and a gas turbine.

PB82-105909 PC **A04**/MF **A01**
Environmental Protection Agency, Ann Arbor, MI. Control Technology Assessment and Characterization Branch.
Current Status of EPA Office of Mobile Source Air Pollution Control Characterization Projects: Summary.
Technical rept.,
Thomas M. Baines. Aug 81, 68p Rept no. EPA-AA-CTAB/PA/81-18

EPA-OMSAPC is conducting a thorough characterization of unregulated emissions on a variety of current and prototype engines. Extensive work is also underway to see how various fuel parameters affect regulated and unregulated emissions. This latter work includes projects on alternate fuels such as methanol as well as fuels derived from coal or oil shale.

PB82-134313 PC **A07**/MF **A01**
Institute for Defense Analyses, Arlington, VA.
Cost Variance Analysis of Certification Cost Estimate for Alaska Segment of ANGTS.
Paper (Final),
James D. McCullough. Sep 81, 139p IDA-P-1594
Contract DE-AC39-80RC-10477

This paper reports on the variance between two cost estimates of the Alaska Segment of the Alaska Natural Gas Transportation System (ANGTS). The first estimate was filed with the Federal Power Commission (FPC) on March 1, 1977 to obtain a conditional certificate of Public Convenience and Necessity. The second estimate was filed with the Federal Energy Regulatory Commission (FERC) on July 1, 1980 to obtain a final certificate.

PB82-136243 PC **A10**/MF **A01**
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Environmental Science.
Sludge Composting and Utilization: Rational Approach to Process Control.
Final rept.,
M. S. Finstein, J. Cirello, S. T. MacGregor, F. C. Miller, and K. M. Psarianos. Jan 80, 221p
RUTGERS/COOK/ES-81-1
Prepared in cooperation with Environmental Protection Agency, Washington, DC., New Jersey Dept. of Environmental Protection, Trenton, City of Camden, and Camden County Municipal Utilities Authority.

The interaction between microbial heat output (at the expense of the waste being treated) and temperature was identified as the fundamental factor in controlling the composting process. The concept was implemented by means of a temperature feedback control system in conjunction with forced pressure ventilation. Field trials involved raw sewage sludge mixed with woodchips, on a scale of up to 20-ton piles. The new process, which is presently available technology, is called the 'Rutgers static pile composting process'. Some of its advantages are as follows: A starting moisture content of 75 percent is decreased to 25 percent in 12 days; This tendency to dry represents the decomposition of putrescible (odor-causing) organic matter; No condensate is produced; The need for a curing stage can be assessed in terms of specific, objective criteria; The process is operationally flexible to meet the vagaries of environmental regulation; The drying tendency might be exploited in the preparation of biomass-derived fuel.

PB82-139452 PC **E09**/MF **E09**
Commission of the European Communities, Luxembourg.
Hybrid Processes for the Production of Hydrogen (Hybridprozesse zur Wasserstofferzeugung).
Final rept.,
W. Seeger, and H. Steeb. c1980, 242p EUR-6965-DE
Text in German.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Research and development work was undertaken to find novel hybrid electrochemical cycles for the production of hydrogen from water and to examine relevant electrolytic reactions in aqueous solution for generating hydrogen; reactions were to be restricted to inorganic compounds and metal deposition was to be avoided. Investigations dealt with the selection of electrolytes and complementary thermochemical reactions and with the identification of reactions critical to the thermochemical cycles and their substitution by electrolytic reactions. Three hybrid processes were investigated involving copper, iron, and antimony. It was concluded that electrolytes generating only hydrogen were of interest for hybrid cycles. Reduction to gaseous hydrogen should be combined with the oxidation of metallic cations in an acid medium. Electrolytic oxygen generation must be prevented.

PB82-139460 PC **E05**/MF **E05**
Commission of the European Communities, Luxembourg.
Experimental Study of the Combustion of Low-Grade Calorific Material with the Aim of Assessing its Utility Value (Etude Experimentale de la Combustion Des Matieres a Faible Pouvoir Calorifique en Vue de Leur Valorisation).
Final rept.,
R. H. Busso, and J. Ch. Dubart. c1981, 103p EUR-7165-FR
Text in French.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Tests on the utilization of low-grade fuels were carried out on Toarcian bituminous shales and the coal shales of the Northern Pas-de-Calais Basin in a pyrolysis shaft furnace, a rotating furnace, a coal dust furnace and an Ignifluid furnace. Under technical conditions, the combustion of Toarcian bituminous shales requires enrichment with either coal or gas. Even the indirect combustion process (with a pyrolysis shaft furnace) is far from satisfying economic requirements. However, they might be reached with higher grade bituminous shales. The technical feasibility of using coal shales, especially in pulverized form, has been established. However, the additional charges incurred by an industrial plant at the preparatory stage of the fuel as well as by complying with environmental standards must be taken into account. Nevertheless, it may be possible to ensure satisfactory economic conditions if the coal shales are used in blends. Economically, whatever route is chosen, the utilization of these low-grade fuels is handicapped because of the size of the industrial plants required, which entails high capital expenditure with risks that are difficult to assess and made worse by equipment maintenance problems.

PB82-802521 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Hydrogen Use as a Fuel. 1964-October, 1981 (Citations from the NTIS Data Base).
Rept. for 1964-Oct 81.
Dec 81, 230p
Supersedes PB80-813090, and NTIS/PS-79/0779.

Federally-funded research studies pertaining to the technical feasibility of using hydrogen as a fuel for vehicular transportation, electric power generation, and both subsonic and supersonic aircraft are discussed. Excluded are studies on hydrogen production and storage. These topics are covered in other bibliographies. (This updated bibliography contains 224 citations, 18 of which are new entries to the previous edition.)

PB82-859505 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Zeolites in Catalysis. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 292p
Supersedes PB81-855918. Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography covers the catalytic effects of zeolites and zeolite-containing catalysts in the catalytic cracking, reforming, and refining of hydrocarbons from fossil fuels; i.e., petroleum, coal liquids, etc. Also considered are the use of zeolites as catalyst supports in the chemical preparation of hydrocarbons from methanol, in desulfurization processes, and in the reduction of nitrogen oxides. (This updated bibliography contains 300 citations, 119 of which are new entries to the previous edition.)

PB82-859521 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Purox Pyrolysis Process. 1976-1981 (Citations from the Energy Data Base).
Rept. for Jan 76-Dec 81.
Dec 81, 78p
Supersedes PB81-854937. Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography covers descriptions, evaluations, and general and specific applications of the pollution-free Purox Pyrolysis Process for deriving fuels and chemicals from municipal, industrial, and agricultural wastes. Some consideration is given to the environmental benefits of this Process as well as to the energy benefits. (This updated bibliography contains 67 citations, 13 of which are new entries to the previous edition.)

21E. Jet and Gas Turbine Engines

AD-A106 890/7 PC **A07**/MF **A01**
Naval Postgraduate School, Monterey, CA.
An Analytical and Experimental Analysis of Factors Affecting Exhaust System Performance in Sea Level Static Jet Engine Test Facilities.
Engineers thesis,
David Laurence Bailey. Dec 72, 130p

The study was motivated by a request from the Naval Air Rework Facility, NAS North Island, that work be conducted to obtain information on parameters affecting exhaust system performance in sea level static jet engine test facilities. The cost of pollution abatement devices makes it mandatory that accurate knowledge of flow parameters be developed. The study investigated by theory and experiment certain parameters of test cell design. A computer program based on the one-dimensional mass, momentum and energy conservation equations was developed. Components were designed to test on a scale of 24:1 the effects of varying exhaust system configurations. Theoretical results were found to be in good agreement with experimental data, indicating that the program may be used to analyze full scale systems. Recommendations for

future development in the analysis and experimental program were made. (Author)

AD-A107 315/4 PC **A08**/MF **A01**
General Electric Co., West Lynn, MA. Aircraft Engine Group.
Diagnostic and Condition Monitoring System Assessment for Army Helicopter Modular Turboshaft Engines.
Final rept. Jun 79-Jun 80,
Harold J. Jordan. Oct 80, 151p Rept no. R80AEG058
Contract DAAK51-79-C-0020

Needs for and means of improving D&CM and troubleshooting to modules and LRUs for T700-GE-700 engine in Army environment were studied. Recommendations are: (1) Do not modify existing METS for modular fault isolation. However, do computerize the acquisition of the overall engine performance data, (2) introduce the slave chip detector to the depot, (3) expand evaluation of the control system analyzer by Black Hawk companies, (4) support the development of degaussing chip detector, (5) initiate Phase I of multipurpose airborne D&CM system which combines performance, life, overtemp and chip detector monitors, and (6) continue to acquire T700 field data and develop a method to quantify D&CM payoffs such as better engine availability. (Author)

AD-A107 436/8 PC **A03**/MF **A01**
Boeing Co., Seattle, WA.
Design and Fabrication of Coanda Suppressor Flow Visualization Model,
Dale W. Brees. 10 Feb 77, 37p Rept no. D3-11158-1

Because the Navy Coanda noise suppressor exhibited three-dimensional flow anomalies a 1/20th scale transparent laboratory model was fabricated to provide for visualization of the internal flow. Identification of flow anomalies and methods of correcting them by geometric design changes thus eliminating local acoustic lining erosion was the primary purpose for the model. In addition, model experimental flow data were to be correlated to analytical computer codings so they could be applied to Coanda suppression system designs with a higher level of confidence.. The 1/20th scale transparent model was fabricated and installed in the Boeing-Wichita air laboratory. Several checkout runs were made and the functional capability of the system was verified. These checkout runs showed that the model accurately represents the full scale flow and recirculation that had been deduced from the full scale demonstration tests. (Author)

AD-A107 439/2 PC **A05**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Performance of an Oswatisch Inlet with Hemispherical Centerbody at Zero Angle of Attack.
Master's thesis,
John Francis Moran. Jun 81, 87p Rept no. NPS67-81-009
ARPA Order-4035

This thesis analyzes the performance of a ramjet with an Oswatisch inlet using a blunt centerbody and compares performance to a baseline ramjet using an inlet with a conical spike at Mach 3.0. Inlet performance as a ratio of inlet tip to nose centerbody ratio, r sub L/r sub n, is developed. The capture streamline for each ratio is determined and the coefficient of additive drag is calculated as a function of r sub L/r sub n. Setting thrust coefficient equal to coefficient of drag, the performance of two ramjets is determined. One ramjet is the baseline with a spike inlet; the other ramjet uses the blunt centerbody. Ramjets and inlets are compared on the basis of specific fuel consumption, excess thrust coefficient and specific thrust. For the ramjet with blunt centerbody, performance parameters were calculated as a function of inlet lip radius to nose centerbody radius. Also compared is the effect of the ratio, r sub L/r sub n, on relative detection range. For both types of ramjets, the detection range is reduced by approximately 66%. Performance of the ramjet with blunt nosed centerbody is severly handicapped due to high additive drag and poor pressure recovery. Specific fuel consumption is approximately 50% greater for the ramjet with the blunt centerbody compared to the ramjet with the spike inlet. (Author)

AD-A107 441/8 PC **A03**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Modeling Solid-Fuel Ramjet Combustion Including Radiation Heat Transfer to the Fuel Surface.
Interim rept.,
Michael E. Metochianakis, William V. Goodwin, Uri Katz, and David W. Netzer. Aug 81, 50p Rept no. NPS67-81-012

Radiation heat transfer from soot in the flame zone to the fuel surface of a solid fuel ramjet was incorporated into an existing two-dimensional computer code. Improved prediction of the fuel regression pattern was obtained. Near-wall temperature measurements indicated that the model predicts too much turbulent mixing near the fuel surface. (Author)

AD-A107 445/9 PC **A03**/MF **A01**
Exotech Pty Ltd., Monterey, CA.
Multistage Axial Compressor Program on Tip Clearance Effects.
Contractor rept. May 79-Aug 81,
I. Moyle. Aug 81, 49p NPS-67-81-01CR
Contract N62271-80-M-2504

Tip clearance has long been known to be a source of losses in axial compressors with cantilevered blades. The reasons for the losses, however, are not well understood and current practice in engine design still requires extensive effort to maintain constant minimal operating clearances over a wide range of conditions. The emphasis on clearance control may be appreciated by the typical observation that a ten percent change in peak static pressure rise in a compressor stage may occur for a fifty percent change in clearance. Clearances are typically in the one to five percent of major passage dimension range, and thus a small change in passage dimensions represents a large change in clearance. It is clear that, in general, it would be desirable that blading performance be less sensitive to changes in clearance. Less sensitivity would allow a general relaxation of the mechanical tolerances on a compressor assembly and provide more consistent transient performance. The aerodynamics of achieving such a situation are a challenge as the underlying requirement is improved performance at larger clearances. Work toward understanding the basic mechanisms of tip clearance effects with an emphasis on designing for clearance has been commenced at the Naval Postgraduate School turbopropulsion Laboratory (NPS/TPL). This report summarizes the preliminary work on the Multistage Compressor (MSC) facility at the Laboratory.

DE81904231 PC **A04**/MF **A01**
COECORP, Mountain View, CA.
Investigation and Research of Specific Combustion-Turbine and Combined-Cycle Field Problems. Annual Report.
Aug 81, 62p EPRI-AP-1981

During 1980, EPRI coordinated the investigation and research efforts dealing with five specific combustion turbine and combined cycle field problems. These are (1) fuel filter plugging, (2) apparent compressor surge, (3) oily waste water, (4) compressor wheel failure, and (5) combustor problems. EPRI coordination efforts are detailed, and the results of the efforts are outlined. (ERA citation 06:034679)

N82-11031/3 PC **A06**/MF **A01**
Pennsylvania State Univ., University Park. Dept. of Aerospace Engineering.
Analytical and Experimental Study of Flow Phenomena in Noncavitating Rocket Pump Inducers.
Final Report.
B. Lakshminarayana. Oct 81, 104p NASA-CR-3471, PSU-TURBO-R81-3
Contract NGL-39-009-007

The flow processes in rocket pump inducers are summarized. The experimental investigations were carried out with air as the test medium. The major characteristics features of the rocket pump inducers are low flow coefficient (0.05 to 0.2) large stagger angle (70 deg to 85 deg) and high solidity blades of little or no camber. The investigations are concerned with the effect of viscosity not the effects of cavitation. Flow visualization, conventional and hot wire probe measurement inside and at the exit of the blade passage, were the analytical methods used. The experiment was carried out using four three and two bladed inducers with cambered blades. Both the passage and the exit flow were measured. The basic research and boundary layer investigation was carried out using a helical flat plate (of some dimensions as the inducer blades tested), and flat plate helical inducer (four bladed). Detailed mean and turbulence flow field inside the passage as well as the exit of the rotor were derived from these measurement. The boundary layer, endwall, and other passage data reveal extremely complex nature of the flow, with major effects of viscosity present across the entire passage. Several analyses were carried out to predict the flow field in inducers. These included an approximate analysis, the shear pumping analysis, and a numerical solution of exact viscous equations with approximate modeling for the viscous terms.

N82-11041/2 PC **A03**/MF **A01**
Flow Research Co., Kent, WA.
Calculations of Transonic Potential Flow over Cascades.
Final Report.
W. H. Jou. Oct 81, 36p NASA-CR-165471, FRR-182
Contract NAS3-22129

Transonic flow through a cascade was studied by using the full potential equation and the finite volume method of Jameson and Caughey. The C-type computational grid is generated by an electrostatic analogy and simple shearing transformation. The solution algorithm includes an option of using either an artificial density or an artificial viscosity formulation of the dissipative term. Using the developed code, flows through a cascade of NACA 0012 airfoils and flows through a cascade of shockless blades were computed. It is found that the designed flow through the shockless blade is accurately predicted, the artificial density formulation shows more tolerance to the mesh irregularity, and the C-type mesh does not extend very far upstream for a small pitch-cord ratio.

N82-11067/7 PC **A02**/MF **A01**
National Aerospace Lab., Tokyo (Japan).
New Molding Method of Three-Dimensional Hollow Photoelastic Model and Centrifugal Stress Analysis of Air Cooled Turbine Blade Model.
T. Yoshida, K. Matsusue, K. Takahara, and R. Hashimoto. May 81, 17p NAL-TR-427T, ISSN-0389-4010
In English; Japanese Summary.

A new molding method for a three dimensional hollow photoelastic model was invented and centrifugal stress analysis performed for air cooled turbine blade models to which the new method was applied. A distinctive feature of the molding method is the introduction of a copper coated wax core which forms a three dimensional hollow shape inside a model. The air cooled turbine photoelastic model with a coolant passage simulates the first stage rotor blade in the high temperature turbine full scale model HT-10H used at the NAL. The results of stress analysis cleared the critical regions and stress magnitude and thus they are of great aid to the successful development of a full scale turbine model.

N82-11467/9 PC **A03**/MF **A01**
Pratt and Whitney Aircraft Group, East Hartford, CT.
JT8D High Pressure Compressor Performance Improvement.
Progress Report, Sep. 1978 - Apr. 1981.
W. O. Gaffin. 11 Nov 81, 47p NASA-CR-165531, PWA-5515-162
Contract NAS3-20630

An improved performance high pressure compressor with potential application to all models of the JT8D engine was designed. The concept consisted of a trenched abradable rubstrip which mates with the blade tips for each of the even rotor stages. This feature allows tip clearances to be set so blade tips run at or near the optimum radius relative to the flowpath wall, without the danger of damaging the blades during transients and maneuvers. The improved compressor demonstrated thrust specific fuel consumption and exhaust gas temperature improvements of 1.0 percent and at least 10 C over the takeoff and climb power range at sea level static conditions, compared to a bill-of-material high pressure compressor. Surge margin also improved 4 percentage points over the high power operating range. A thrust specific fuel consumption improvement of 0.7 percent at typical cruise conditions was calculated based on the sea level test results.

ORNL/TM-6253 PC **A07**/MF **A01**
Oak Ridge National Lab., TN.
Summary of the Research and Development Effort on Open-Cycle Coal-Fired Gas Turbines.
M. E. Lackey. Oct 79, 126p
Contract W-7405-ENG-26

Extensive experience gained with gas turbines operating not only with coal as fuel but also with dusty inlet air and with dirty fuels (such as heavy oils and blast furnace gas) as well as petroleum catalytic cracking units was reviewed. All this experience indicates that the particulate content of the hot gases fed to the turbine must be kept to less than approx. 1 ppM to keep turbine bucket erosion to an acceptable level for turbine inlet temperatures of 1500 exp 0 F or more. Dropping the turbine inlet temperature below 1110 exp 0 F makes it possible to obtain turbine bucket lives of around 3 yr with approx. 100 ppM of particulates if a number of compromises are made in the turbine design. A buildup of deposits in the turbine is a serious problem if sulfates or chlorides are present in the gas stream and the turbine inlet temperature is above approx. 1110 exp 0 F. At this temperature level, these materials become soft and sticky and form films on the blades that accumulate deposits of the silicates and oxides present in the ash of a coal-fired combustor. Extensive experience with many types of cyclone separators shows that they can be used to reduce the particulate content to as low as approx. 100 ppM under the best conditions. Granular bed filters have yielded similar performance. Electrostatic precipitators are not effective above approx. 1110 exp 0 F because the dust deposits on insulators become conducting and short out the grids. The only effective way found to reduce the particulate content of blast furnace gas and gas from coal gasification units to the approx. 1 ppM required for a high-temperature gas turbine is to cool the gas and pass it through a two-stage water scrubber or equivalent before burning it. In brief, it appears doubtful that any of the hot-gas clean-up concepts being investigated will yield the low particulate contents required for the satisfactory, economical operation of 1500 to 1600 exp 0 F long-lived gas turbines. (ERA citation 05:004474)

21G. Reciprocating Engines

LA-UR-80-1633 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Numerical Simulation of Reactive Flow in Internal Combustion Engines.
L. D. Cloutman, J. K. Dukowicz, and J. D. Ramshaw. 1980, 7p CONF-800661-1
Contract W-7405-ENG-36
International conference on numerical methods in fluid dynamics, Palo Alto, CA, USA, 23 Jun 1980.

Multidimensional numerical simulations of the reactive fluid flow in an internal combustion engine cylinder are useful in helping engine designers obtain insight into the physical mechanisms governing efficiency and pollutant formation. A comprehensive numerical model for internal combustion engine cylinder simulations that has been developed at Los Alamos is described. The model is currently embodied in a two-dimensional (axisymmetric) computer code called CONCHAS-SPRAY. Work is in progress on a three-dimensional code with the same features. (ERA citation 05:029271)

N82-11068/5 PC **A04**/MF **A01**
Teledyne Continental Motors, Muskegon, MI. General Products Div.
Lightweight Diesel Engine Designs for Commuter Type Aircraft.
A. P. Brouwers. Jul 81, 70p NASA-CR-165470, REPT-995
Contract NAS3-22149

Conceptual designs and performance of advanced technology lightweight diesel engines, suitable for commuter type aircraft power plants are defined. Two engines are discussed, a 1491 kW (2000 SHP) eight-cylinder engine and a 895 kW (1200 SHP) six-cylinder engine. High performance and related advanced technologies are proposed such as insulated cylinders, very high injection pressures and high compressor and turbine efficiencies. The description of each engine includes concept drawings, a performance analysis, and weight data. Fuel flow data are given for full and partial power up to 7620m altitude. The performance data are also extrapolated over a power range from 671 kW(900SHP) to 1864 kW (2500 SHP). The specific fuel consumption of the 1491 kW (2000 SHP) engine is 182 g/hWh (.299 lb/HPh) at cruise altitude, its weight 620 kg (1365 lb.) and specific weight .415 kg/kW (.683 lb/HP). The specific fuel consumption of the 895 kW (1200 SHP) engine is 187 g/hWh (.308 lb/HPh) at cruise altitude, its weight 465 kg (1025 lb.) and specific weight .520 kg/kW (.854 lb/HP).

N82-11466/1 PC **A05**/MF **A01**
Mechanical Technology, Inc., Latham, NY.
Preliminary Study of Temperature Measurement Techniques for Stirling Engine Reciprocating Seals.
Final Report.
D. F. Wilcock, L. Hoogenboom, M. Meinders, and W. O. Winer. Aug 81, 82p NASA-CR-165479, DOE/NASA/0227-1
Contracts DEN3-227, DE-AI01-77CS-51040
Prepared in Cooperation with Georgia Inst. Of Tech.

Methods of determining the contact surface temperature in reciprocating seals are investigated. Direct infrared measurement of surface temperatures of a rod exiting a loaded cap seal or simulated seal are compared with surface thermocouple measurements. Significant cooling of the surface requires several milliseconds so that exit temperatures may be considered representative of internal contact temperatures.

N82-11993/4 PC **A03**/MF **A01**
Rasor Associates, Inc., Sunnyvale, CA.
Jet Impingement Heat Transfer Enhancement for the GPU-3 Stirling Engine.
D. C. Johnson, C. W. Congdon, L. L. Begg, E. J. Britt, and L. G. Thieme. Oct 81, 28p NASA-TM-82727, DOE/NASA/51040/33

A computer model of the combustion-gas-side heat transfer was developed to predict the effects of a jet impingement system and the possible range of improvements available. Using low temperature (315 C (600 F)) pretest data in an updated model, a high temperature silicon carbide jet impingement heat transfer system was designed and fabricated. The system model predicted that at the theoretical maximum limit, jet impingement enhanced heat transfer can: (1) reduce the flame temperature by 275 C (500 F); (2) reduce the exhaust temperature by 110 C (200 F); and (3) increase the overall heat into the working fluid by 10%, all for an increase in required pumping power of less than 0.5% of the engine power output. Initial tests on the GPU-3 Stirling engine at NASA-Lewis demonstrated that the jet impingement system increased the engine output power and efficiency by 5% - 8% with no measurable increase in pumping power. The overall heat transfer coefficient was increased by 65% for the maximum power point of the tests.

N82-11994/2 PC **A05**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Evaluation of the Micro-Carburetor.
M. F. Weiss, R. A. Hall, and S. D. Mazor. Aug 81, 83p NASA-CR-164958, JPL-PUB-81-75
Contracts NAS7-100, DE-AI01-79CS-50080

A prototype sonic, variable-venturi automotive carburetor was evaluated for its effects on vehicle performance, fuel economy, and exhaust emissions. A 350 CID Chevrolet Impala vehicle was tested on a chassis dynamometer over the 1975 Federal Test Procedure, urban driving cycle. The Micro-carburetor was tested and compared with stock and modified-stock engine configurations. Subsequently, the test vehicle's performance characteristics were examined with the stock carburetor and again with the Micro-carburetor in a series of on-road driveability tests. The test engine was then removed from the vehicle and installed on an engine dynamometer. Engine tests were conducted to compare the fuel economy, thermal efficiency, and cylinder-to-cylinder mixture distribution of the Micro-carburetor to that of the stock configuration. Test results show increases in thermal efficiency and improvements in fuel economy at all test conditions. Improve fuel/air mixture preparation is implied from the information presented. Further improvements in fuel economy and exhaust emissions are possible through a detailed recalibration of the Micro-carburetor.

21H. Rocket Motors and Engines

N82-11110/5 PC **A03**/MF **A01**
Boeing Aerospace Co., Seattle, WA.
Study of Electrical and Chemical Propulsion Systems for Auxiliary Propulsion of Large Space Systems. Volume 1: Executive Summary.
W. W. Smith, and J. P. Clark. Nov 81, 35p NASA-CR-165502-V-1, D180-25956-3-V-1
Contract NAS3-21952

The objective was to determine the direction auxiliary propulsion research and development should take to best meet upcoming needs. The approach used was to define the important electrical and chemical propulsion characteristics in terms of the demands that will be imposed by future spacecraft. Comparison of these desired characteristics and capabilities with those presently available was then used to identify deficiencies.

N82-11111/3 PC **A23**/MF **A01**
Boeing Aerospace Co., Seattle, WA.
Study of Electrical and Chemical Propulsion Systems for Auxiliary Propulsion of Large Space Systems, Volume 2.
Final Report.
W. W. Smith. Nov 81, 540p NASA-CR-165502-V-2, D180-2595-4-V-L-2
Contract NAS3-21952

The five major tasks of the program are reported. Task 1 is a literature search followed by selection and definition of seven generic spacecraft classes. Task 2 covers the determination and description of important disturbance effects. Task 3 applies the disturbances to the generic spacecraft and adds maneuver and stationkeeping functions to define total auxiliary propulsion systems requirements for control. The important auxiliary propulsion system characteristics are identified and sensitivities to control functions and large space system characteristics determined. In Task 4, these sensitivities are quantified and the optimum auxiliary propulsion system characteristics determined. Task 5 compares the desired characteristics with those available for both electrical and chemical auxiliary propulsion systems to identify the directions technology advances should take.

21I. Rocket Propellants

AD-A107 147/1 PC **A08**/MF **A01**
Pennsylvania State Univ., University Park. Dept. of Mechanical Engineering.
Ignition of Composite Propellants under Rapid Pressure Loading.
Summary rept. 1 Aug 80-31 Jul 81,
Mridul Kumar, Kenneth K. Kuo, Anil K. Kulkarni, and John E. Willis. Sep 81, 170p
Contract N00014-79-C-0762

A comprehensive theeoretical model for ignition of composite solid propellants was proposed as a framework for formulating ignition models for different propellants under a wide range of operating conditions. Detailed chemical kinetics information for the AP/PBAA propellants was incorporated into the proposed theoretical model for ignition of composite solid propellants, enabling a more complete description of source terms in the gas-phase energy and species equations. Solid-phase energy equations were coded and implemented on a computer. Numerical solutions of the solid-phase subprogram were successfully checked against analytic solutions for some limiting cases. Using actual measured heat flux near the propellant surface as an input to the solid-phase equations, predictions for the ignition delay time were made. Effects of pressurization rate, crack-gap width, and igniter-flame temperature on the ignition of AP-based composite solid propellants located at the tip of an inert crack were studied. The ignition process was observed by using a high-speed camera (-40,000 pictures/s) and a fast-response photodiode system. Heat flux to the propellant surface was measured with a thin film heat-flux gage. A bright luminous zone behind the reflected compression wave was observed at high pressurization rates. The decrease in ignition delay with increasing pressurization is caused by enhanced heat feedback to the propellant surface at higher pressurization rates.

22. SPACE TECHNOLOGY

22A. Astronautics

N82-11095/8 PC **A05**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
A Proposed New Policy for Planetary Protection.
J. B. Barengoltz, S. L. Bergstrom, G. L. Hobby, and P. D. Stabekis. 15 Sep 81, 82p NASA-CR-164947, JPL-PUB-81-90
Contract NAS7-100

A critical review of the present policy was conducted with emphasis on its application to future planetary exploration. The probable impact of recent data on the implementation of the present policy was also assessed. The existing policy and its implementation were found to: be excessive for certain missions (e.g., Voyager), neglect the contamination hazard posed by the bulk constituent organics of spacecraft, be ambiguous for certain missions (e.g., Pioneer Venus), and treat all extraterrestrial sample return missions alike. The major features of the proposed policy are planet/mission combinations, a qualitative top level statement, and implementation by exception rather than rule. The concept of planet/mission categories permits the imposition of requirements according to both biological interest in the target planet and the relative contamination hazard of the mission type.

N82-11097/4 PC **A05**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Hungarian Cosmonaut in Space.
Sep 81, 100p NASA-TM-76719
Contract NASW-3198
Transl. Into English of "Magyar Urhajos a Vilagrurben, Mtijelenti" Special Edition, 26 May 1980 p 1-31. Transl. By Scientific Translation Service, Santa Barbara, Calif.

The selection and training of cosmonauts and the preparation of the first Hungarian for flight on Salyut 36 and its linking with Soyuz 6 are described. Biographical sketches of the crew members, the reasons for different types of wearing different types of spacesuits during flight in the space station, and the experiments conducted are discussed. Photographs are included.

22B. Spacecraft

AD-A107 009/3 Not available NTIS
Texas Univ. at Austin.
Acceleration of Methane-Air Ignition by Hydrocarbon Additives,
C. S. Eubank, W. C. Gardiner, Jr., and J. M. Simmie. 1981, 8p ARO-15826.9-C
Grant DAAG29-78-G-0174
Availability: Pub. in Proceedings of the First Specialists Meeting (International) of the Combustion Institute, v2 p336-341, 20-24 Jul 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A107 287/5 PC **A03**/MF **A01**
Calspan Field Services, Inc., Arnold AFS, TN. AEDC Div.
Wind Tunnel Tests of Elevon Gap Heating on the Space Shuttle Orbiter (OH-107).
Final rept.,
D. W. Stallings. Feb 81, 27p AEDC-TSR-81-V7

Tests were conducted in the AEDC/VKF Hypersonic Wind Tunnel (B) to obtain heat-transfer rate measurements in the elevon/elevon and elevon/fuselage gap areas of the Space Shuttle Orbiter. Data were obtained at Mach 8 over a Reynolds number range from 0.5 to 3.7 million per foot. Angles of attack of 30, 35, and 40 deg were run for yaw angles of 0 and 1 deg. (Author)

N81-29506/5 PC **A02**/MF **A01**
National Oceanic and Atomospheric Administration, Houston, TX.
Characteristics, of Tiros, Goes, Dmsp and Landsat Systems.
T. I. Gray, Jr., D. G. Mccrary, and T. A. Armstrong. Mar 81, 21p E81-10192, NASA-CR-160979
Contract PROJ. AGRISTARS
Sponsored by NASA, Usda, Dept. Of Commerce, Dept. Of the Interior, and Agency for International Development.

The characteristics of the TIROS, GOES, DMSP and LANDSAT systems of satellites are described. The data listed for each system are altitude of orbit, inclination/position, orbit type, orbits per day, expected operational lifetime and the sensor systems. The sensor systems are described as to wavelength of each channel, resolution, field of view and other pertinent information. Data information such as availability rate, collection method, primary use/application and how to obtain additional information is also given.

N82-11040/4 PC **A11**/MF **A01**
Northrop Services, Inc., Huntsville, AL.
Space Shuttle Solid Rocket Booster Sting Interference Wind Tunnel Test Analysis.
Final Report.
B. Conine, and W. Boyle. 15 Sep 81, 235p NASA-CR-161885, TR-230-2042
Contract NAS8-33816

Wind tunnel test results from shuttle solid rocket booster (SRB) sting interference tests were evaluated, yielding the general influence of the sting on the normal force and pitching moment coefficients and the side force and yawing moment coefficients. The procedures developed to determine the sting interference, the development of the corrected aerodynamic data, and the development of a new SRB aerodynamic mathematical model are documented.

N82-11051/1 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
The Effects of Lateral Aerodynamic Uncertainties on the Handling Qualities of the Space Shuttle Orbiter at Mach Numbers of 1.5 and .6.
L. W. Brown. Sep 81, 42p NASA-TM-83193

The effects of aerodynamic uncertainties on the handling qualities of the space shuttle orbiter were investigated with the use of six-degree-of-freedom, nonlinear equations of motion on the hybrid computer system. Flight condition characteristics for Mach numbers of 1.5 and .6 for the nominal and off nominal angle of attack conditions were selected for this investigation. Results revealed that at the low Mach number condition (.6), only a few problems existed for the angle of attack range considered and the many combinations of large aerodynamic variations considered. Moreover, none of these problems were considered to be related to poor handling qualities. For the angle of attack conditions considered at the high Mach number (1.5) problems existed with reduction of roll rate which can result in roll reversal conditions. In many cases, sideslip became proverse and increased rudder deflections and yaw jets were required.

N82-11093/3 PC **A06**
National Aeronautics and Space Administration, Washington, DC.
Technology for Large Space Systems: A Special Bibliography.
Jul 81, 109p NASA-SP-7046(05)

This bibliography lists 298 reports, articles, and other documents introduced into the NASA scientific and technical information system between January 1, 1981 and June 30, 1981. Its purpose is to provide helpful, information to the researcher, manager, and designer in technology development and mission design in the area of the Large Space Systems Technology (LSST) Program. Subject matter is grouped according to systems, interactive analysis and design, structural concepts, control systems, electronics, advanced materials, assembly concepts, propulsion, solar power satellite systems, and flight experiments.

N82-11098/2 PC **A05**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Nonparametric Identification of a Class of Nonlinear Close-Coupled Dynamic Systems.
F. E. Udwadia, and C. P. Kuo. 1 Oct 81, 76p NASA-CR-164948, JPL-PUB-81-48

A nonparametric identification technique for the identification of close coupled dynamic systems with arbitrary memoryless nonlinearities is presented. The method utilizes noisy recorded data (acceleration, velocity and displacement) to identify the restoring forces in the system. The masses in the system are assumed to be known (or fairly well estimated from the design drawings). The restoring forces are expanded in a series of orthogonal polnomials and the coefficients of these polynomial expansions are obtained by using least square fit method. A particularly simple and computationally efficient method is proposed for dealing with separable restoring forces. The identified results are found to be relatively insensitive to measurement noise. An analysis of the effects of measurement noise on the quality of the estimates is given. The computations are shown to be relatively quick (when compared say to the Wiener identification method) and the core storage required relatively small, making the method suitable for onboard identification of large space structures.

N82-11099/0 PC **A02**/MF **A01**
Rensselaer Polytechnic Inst., Troy, NY.
Parameter Estimation of Large Flexible Aerospace Structures with Application to the Control of the Maypole Deployable Reflector.
M. J. Balas. 6 Nov 81, 20p NASA-CR-164971
Contract NAG1-171

Systems such as the Maypole deployable reflector have a distributed parameter nature. The flexible column and hoop structure and the circular antenna of 30-100 meter diameter which it supports are described by partial, rather than ordinary, differential equations. Progress completed in reduced order modelling andd controller design and digital parameter estimation and control is summarized. Topics covered include depolyment and on-orbit operation; quasi-static (steady state) operation; dynamic distributed parameter system; autoregressive moving average identification; frequency domain procedures; direct or implicit active control; adaptive observers; parameter estimation using a linear reinforcement learning factor; feedback control; and reduced order modeling for nonlinear systems.

N82-11100/6 PC **A02**/MF **A01**
Howard Univ., Washington, DC. Dept. of Mechanical Engineering.
On the Shape and Orientation Control of an Orbiting Shallow Spherical Shell Structure.
P. M. Bainum, and A. S. S. R. Reddy. 9 Jul 81, 7p NASA-CR-164970
Grant NSG-1414
Presented at the Joint Ifac/Esa Symp. On Automatic Control in Space, Noordwijkerhout, the Netherlands, 5-9 Jul. 1981.

A proposed method for controlling the shape and orientation of very large shallow dish type receiver/reflectors to be used in communication, radiometry and in electronic orbital based mail systems involves connecting a rigid light weight dumbell with heavy tip masses to the shell at its apex by a spring loaded double gimballed joint with dampling. To completely damp the system transient motion in all of the important lower frequency modes, an active control system is required. A mathematical model is extended to include the effects of point actuators located at preselected positions on the shell surface. The formulation of the uncontrolled dynamics assumes an a priori knowledge of the frequencies of all the elastic modes to be incorporated within the system model. As an example, three rigid body modes and six elastic modes are included in the model and six actuators are assumed, none of which lies on a nodal line or circle.

N82-11101/4 PC **A07**/MF **A01**
Westinghouse Electric Corp., Linthicum Heights, MD.
ATS-5 12 Year in Orbit Evaluation.
F. J. Kissel, and J. Schaffer. Sep 81, 140p NASA-CR-166728
Contract NAS5-20825

The results of the ATS 5 End-of-Life (EOL) tests are presented. Whenever possible, the test data were compared with prelaunch and inflight data. Pertinent

memos and other informal documents containing these data are included as appendixes. The EOL tests include communication subsystems tests, power subsystem tests, and gravity gradient television camera system tests.

N82-11102/2 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Mission Operation Report: Rca-D/delta Launch.
18 Nov 81, 27p NASA-TM-84063, O-492-206-81-04

The planned launch of the RCA-D Satcom satellite is described. A Delta 3910 configuration which incorporates an extended long tank Thor booster, nine Castor 4 strap-on motors, a TRW-201 second stage, and an 9-foot fairing will place the spacecraft along a suborbital trajectory. A Thiokol propulsion apogee motor stage will place it in a synchronous transfer orbit. Three days after launch, the spacecraft apogee kick motor will be fired at transfer orbit apogee to circularize its orbit at a geosynchronous altitude of 19,300 nautical miles above the equator at approximately 132 miles west longitude.

N82-11106/3 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Testing of a Spacecraft Model in a Combined Environment Simulator.
J. V. Staskus, and J. C. Roche. 1981, 11p NASA-TM-82723, E-1024
Presented at the 18TH Ann. Conf. On Nucl. And Space Radiation Effects, Seattle, 20-24 Jul. 1981.

A scale model of a satellite was tested in a large vacuum facility under electron bombardment and vacuum ultraviolet radiation to investigate the charging of dielectric materials on curved surfaces. The model was tested both stationary and rotating relative to the electron sources as well as grounded through one megohm and floating relative to the chamber. Surface potential measurements are presented and compared with the predictions of computer modelling of the stationary tests. Discharge activity observed during the stationary tests is discussed and signals from sensing devices located inside and outside of the model are presented.

N82-11434/9 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Dynamic Moire Methods for Detection of Loosened Space Shuttle Tiles.
W. L. Snow, A. W. Burner, and W. K. Goad. Sep 81, 17p NASA-TM-83205

Moire fringe methods for detecting loose space shuttle tiles were investigated with a test panel consisting of a loose tile surrounded by four securely bonded tiles. The test panel was excited from 20 to 150 Hz with in-plane sinusoidal acceleration of 2 g (peak). If the shuttle orbiter can be subjected to periodic excitation of 1 to 2 g (peak) and rigid-body periodic displacements do not mask the change in the Moire pattern due to tile looseness, then the use of projected Moire fringes to detect out-of-plane rockin appears to be the most viable indicator of tile looseness since no modifications to the tiles are required.

N82-11493/5 PC **A03**/MF **A01**
Howard Univ., Washington, DC.
Study of Foldable Elastic Tubes for Large Space Structure Applications, Phase 3.
Final Report.
I. W. Jones, and S. O. Mitchell. Sep 81, 46p NASA-CR-164929
Grant NSG-1320

A bi-convex foldable elastic tube, suitable for use in self deploying space structures, was subjected to a series of buckling tests to deterine initial buckling loads, collapse loads, and the buckling mode. The tube is cylindrical with a cross-section that is lenticular-like with flared edges. It is capable of being flattened in the center and folded compactly, storing up strain energy in the process. Upon removal of constraint, it springs back to its original straight configuration, releasing the stored strain energy. The tests showed that this type of tube has good resistance to buckling, with the initial buckling loads all falling within or above the range of those for comparable circular cylindrical tubes.

N82-11784/7 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
Space Shuttle Main Engine Controller.
R. M. Mattox, and J. B. White. Nov 81, 40p NASA-TP-1932, M-360

A technical description of the space shuttle main engine controller, which provides engine checkout prior to launch, engine control and monitoring during launch, and engine safety and monitoring in orbit, is presented. Each of the major controller subassemblies, the central processing unit, the computer interface electronics, the input electronics, the output electronics, and the power supplies are described and discussed in detail along with engine and orbiter interfaces and operational requirements. The controller represents a unique application of digital concepts, techniques, and technology in monitoring, managing, and controlling a high performance rocket engine propulsion system. The operational requirements placed on the controller, the extremely harsh operating environment to which it is exposed, and the reliability demanded, result in the most complex and rugged digital system ever designed, fabricated, and flown.

N82-11816/7 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
SPAR Data Set Contents.
S. W. Cunningham. Oct 81, 41p NASA-TM-83181

The contents of the stored data sets of the SPAR (space processing applications rocket) finite element structural analysis system are documented. The data generated by each of the system's processors are stored in a data file organized as a library. Each data set, containing a two-dimensional table or matrix, is identified by a four-word name listed in a table of contents. The creating SPAR processor, number of rows and columns, and definitions of each of the data items are listed for each data set. An example SPAR problem using these data sets is also presented.

22C. Spacecraft Trajectories and Reentry

AD-A106 997/0 PC **A08**/MF **A01**
Avco-Everett Research Lab., Inc., Everett, MA.
Maui Optical Tracking and Identification Facility Transition Program.
Final technical rept. 1 Aug 77-31 Jan 80,
Jamie Chapman, and Thomas Reed. Aug 81, 152p RADC-TR-81-243
Contract F30602-77-C-0184

This report summarizes the Maui Optical Tracking and Identification Facility (MOTIF) Transition Program results. A description of the system hardware and software as well as the modifications and system upgrades that were accomplished during the program are presented. The Communications System (CMS) and the Data Transmission System (DTS) tasks represented the major hardware procurements of the MOTIF Transition Program. The CMS has a MODCOMP (MC) II computer system with peripherals and an Analytics TLC-100 Telecommunications Line Controller. A MC IV computer system with peripherals and a Tektronix 4014-1 Graphics Display Terminal comprise the DTS. A MC V system with peripherals constitutes a spare system for both CMS and DTS. The CMS and DTS hardware systems provide the automatic data processing capability and improved communications response time required. They also provide added computer capability for other software enhancements. MOTIF was operated five nights per week, single shift to collect metric, photometric, and LWIR data. Special computer software was developed to process metric and photometric data in support of those operations. On the average and weather permitting, 15 to 30 objects were tracked for metric data with one tasked photometric track per night.

AD-A107 035/8 PC **A05**/MF **A01**
Environmental Research and Technology, Inc., Concord, MA.
Study of Meteorological Conditions Along Actual or Proposed Reentry Trajectories.
Final rept. Dec 78-Mar 81,
Kenneth R. Hardy, David W. Blood, Allan J. Bussey, Hsiao-hua K. Burke, and Robert K. Crane. Mar 81, 83p AFGL-TR-81-0184
Contract F19628-79-C-0007

The Air Force Geophysics Laboratory (AFGL) has been tasked by the Space Division (SD) of the Air Force Systems Command to provide meteorological support and analyses in support of the Advanced Ballistic Reentry Systems (ABRES) Program. The primary objectives of the work carried out under this contract by Environmental Research and Technology, Inc. (ERT) have been to assist AFGL in: (1) the design and analyses of experiments to assess the probable error of the AGFL aircraft/radar methodology for characterizing the cloud microphysical environment along a reentry trajectory, (2) the development and testing of improved analytical methods for describing the cloud microphysical environment along a reentry trajectory, and (3) the generation of environmental statistics to be used as input to operations analyses of possible future reentry tests of experiments. Another major portion of the work involved the maintenance and running of many computer programs; these programs have been documented and form a part of this report.

AD-A107 537/3 PC **A04**/MF **A01**
Johns Hopkins Univ., Laurel, MD. Applied Physics Lab.
Kinematics, Dynamics, and Estimation of Rigid-Body Motion Using Euler Parameters (Quaternions).
Technical memo.,
W. L. Ebert. Nov 81, 59p Rept no. JHU/APL/TG-1329
Contract N00024-81-C-5301

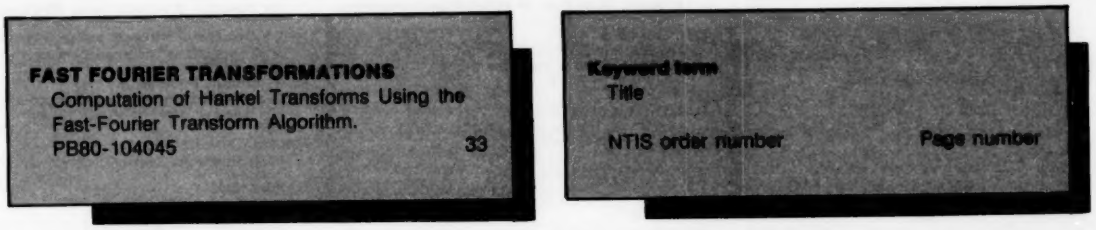
This report explores the algebraic and measure-theoretic properties of the Euler parameter (quaternion) representation of the rotation group. A family of probability densities on this group is examined, and schemes for numerical integration and estimation of satellite attitude are presented with numerical examples. An effort has been made wherever possible to deal with nonlinear problems directly rather than linearizing them. Several questions for further research are raised regarding convolutions of densities on the group, Brownian motion, and the statistics of spin and torque vectors considered as stochastic variables. (Author)

KEYWORD INDEX

NTIS®

Index entries in this section are selected to indicate important ideas and concepts presented in a report. When using the keyword index, be sure to look under terms narrower, broader, or related to a particular topic. Although some of the keywords are not selected from a controlled vocabulary of terms, most of them have been selected from the DoD, DoE, NASA, or NTIS controlled vocabularies. The entries are arranged by keyword and then by the NTIS order number.

SAMPLE ENTRY



A-7 AIRCRAFT
A Comparison of Theoretical and Experimental Pressure Distributions for Two Advanced Fighter Wings.
N82-11054/5 1078

ABANDONED SITES
Summary of the Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000816 1244

ABATE
TEMEPHOS: O,O'-(thiodi-4,1-phenylene) bis(O,O-dimethyl phosphorothioate), Pesticide Registration Standard.
PB82-140641 1216

ABSORBERS (MATERIALS)
Carbon Dioxide Absorption Characteristics of High Performance Sodasorb at 1 Atmosphere.
AD-A107 488/9 1140

Molecular Sieves. 1976-1981 (Citations from the Energy Data Base).
PB82-858499 1147

Molecular Sieves. 1970-1981 (Citations from the NTIS Data Base).
PB82-858507 1147

ABSORPTION SPECTRA
Symmetry Extinction of LEED Beams for Naphthalene Adsorbed on Pt(III).
AD-A106 963/2 1148

Solitons in Polyacetylene: Effects of Dilute Doping on Optical Absorption Spectra.
AD-A106 964/0 1148

ABSORPTIVITY
A Model Describing the Microwave Emission from a Multi-Layer Snowpack at 37 Ghz.
N82-11510/6 1169

ABSTRACTS
Nasa Patent Abstracts Bibliography: A Continuing Bibliography, Section 1, Abstracts. Supplement 19.
N82-11981/9 1095

ACCELEROMETERS
Trusted Interval in the Fourier Spectra of Accelerograms Digitized Either Manually or by Semi-Automatic Means (Intervalo Confiable en el Espectro de Fourier Obtenido de Acelerogramas Digitizados Manualmente o Con Medios Semiautomaticos),
PB82-135393 1169

ACCESS METHODS
The Subject Access Problem - Opportunities for Solution: A Workshop Held at Springfield, Virginia on 18-20 October, 1978.
PB82-134529 1096

ACCESS ROADS
Jamaica Feeder Roads: An Evaluation.
PB82-133802 1213

ACCIDENT ANALYSIS
Station Blackout at Browns Ferry Unit One - Accident Sequence Analysis,
NUREG/CR-2182-V1 1248

Yellow Bar Experimental Carriageway Markings - Accident Study,
PB82-135328 1225

ACCIDENTS
Railroad Accident Report: Brief Format Number 5, 1979.
PB82-128091 1210

Railroad Accident Report: Brief Format Issue Number 1, 1980.
PB82-128109 1210

ACCOUNTING
The Guaranteed Student Loan Information System Needs a Thorough Redesign to Account for the Expenditure of Billions.
AD-A106 875/8 1088

The Navy Must Improve Its Accountability for Conventional Ammunition.
AD-A107 174/5 1230

Status Report on Implementation of GAO's Audit Findings and Recommendations.
AD-A107 376/6 1090

Cooperative Extension Service's Mission and Federal Role Need Congressional Clarification.
AD-A107 482/2 1102

Farm Sector Application of Flow-of-Funds Accounting.
PB82-137738 1093

ACETALDEHYDE/CHLORO
Chloroacetaldehyde (Analytical Method S11).
PB82-107244 1140

ACETYLENE
Creation and Annihilation of Solitons, Radicals, and Ions in Polyacetylene as Related to the Mechanisms of Isomerization, Doping and Conduction.
AD-A107 122/4 1195

The Chemistry of Polyacetylene Doping.
AD-A107 165/3 1195

(13)C NMR of AsF5 Doped Polyacetylene.
AD-A107 167/9 1149

Soliton Formation and cis trans Isomerization in Polyacetylene.
AD-A107 274/3 1195

ACHIEVEMENT TESTS
A Validity Comparison of Adaptive and Conventional Strategies for Mastery Testing.
AD-A106 867/5 1106

Procedures for Criterion Referenced Tailored Testing.
AD-A107 135/6 1111

The Use of the Sequential Probability Ratio Test in Making Grade Classifications in Conjunction with Tailored Testing.
AD-A107 367/5 1112

ACID CARBONATES
Research in Nuclear Chemistry. Progress Report, March 1, 1981-February 28, 1982.
DE81030542 1150

ACID ELECTROLYTE FUEL CELLS
Fuel-Cell Applied Research: Electrocatalysis and Materials. Quarterly Report, October 1, 1980-December 31, 1980.
DE82000173 1186

ACID RAIN
Effects of Acid Precipitation in North America.
PB82-128117 1136

Acid Precipitation. June, 1976-December, 1981 (Citations from the Energy Data Base).
PB82-859281 1085

ACIDS
The Debate over Acid Precipitation--Opposing Views--Status of Research.
AD-A106 925/1 1083

ACOUSTIC ARRAYS
Underwater Target Tracking Using Measurements from a Linear Array of Omnidirectional Acoustic Elements.
AD-A107 070/5 1232

KEYWORD INDEX

ACOUSTIC DELAY LINES
Establishment of Production Techniques for Transducer Acoustic Delay Lines on a Pilot Line Basis.
AD-A107 339/4 1178

ACOUSTIC EMISSIONS
Magnetomechanical Acoustic Emission--A New Method for Non-Destructive Stress Measurement.
AD-A107 228/9 1228

ACOUSTIC MEASUREMENT
Acoustic Model Power Distribution in a Duct at High Frequencies.
PB82-139064 1229

ACOUSTIC MEASUREMENTS
Handbook for Industrial Noise Control.
N82-11858/9 1252

ACOUSTIC PROPAGATION
SEL and EPNL Noise Duration Coefficients for the 747 and T-38 Aircraft.
N82-11860/5 1078

ACOUSTIC REFRACTION
Refracted Ray Characteristics from the Geometrical Spreading Equation for Depth-Dependent Media.
AD-A107 216/4 1252

ACOUSTIC SCATTERING
Covariance Functions and Related Statistical Properties of Acoustic Backscattering from a Randomly Rough Air-Water Interface.
AD-A107 169/5 1252

ACOUSTIC SIGNATURES
The Underwater Acoustic Signature of a Nuclear Explosion at the Ocean Surface.
AD-A107 359/2 1241

ACOUSTIC WAVES
Refracted Ray Characteristics from the Geometrical Spreading Equation for Depth-Dependent Media.
AD-A107 216/4 1252

ACOUSTICS
Laser Photoacoustic Technique for NDE.
AD-A107 388/1 1228

ACTINIDE COMPLEXES
Research in Nuclear Chemistry. Progress Report, March 1, 1981-February 28, 1982.
DE81030542 1150

ACTINIDES
Applications of DHDECMP Extraction Chromatography to Nuclear Analytical Chemistry.
DE81030134 1150

Research in Nuclear Chemistry. Progress Report, March 1, 1981-February 28, 1982.
DE81030542 1150

Distribution of Actinide Elements in Sediments: Leaching Studies.
ORO-3852-39 1156

ACTIVATED SLUDGE PROCESS
Activated Sludge treatment. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859349 1218

ADAPTIVE CONTROL SYSTEMS
Theory and Applications of Optimal Control in Aerospace Systems,
AD-A106 937/6 1078

ADAPTIVE FILTERS
The Time-Sequenced Adaptive Filter.
AD-A106 908/7 1178

Adaptive Design of Digital Filters.
AD-A106 909/5 1178

Multichannel Adaptive Filtering for Signal Enhancement.
AD-A106 910/3 1233

ADAPTIVE SYSTEMS
Performance Advantage of Complex LMS Controlling Narrow-Band Adaptive Arrays.
AD-A107 231/3 1178

ADAPTIVE TRAINING
Ordinal Syllabus for Air Intercept Controller Prototype Training System.
AD-A107 000/2 1106

ADDITIVES
The Stability of New Transparent Polymeric Materials: The Epoxy Trimethoxyboroxine System. Part 1: The Preparation, Characterization and Curing of Epoxy Resins and Their Copolymers.
N82-11208/7 1195

ADHESION
Universal Binding Energy Relations in Metallic Adhesion.
N82-11183/2 1189

Dynamic Moire Methods for Detection of Loosened Space Shuttle Tiles.
N82-11434/9 1273

ADHESIVE BONDING
Environmental Failure of Adhesive Bonding in Composites.
AD-A107 538/1 1190

ADINA COMPUTER PROGRAM
Automatic Input Data Generation for ADINA and NASTRAN Structural Computer Codes.
AD-A107 534/0 1262

ADJUSTMENT (PSYCHOLOGY)
As Parents Go, So Go the Children. The Development and Adjustment of Children in the Military.
AD-A107 347/7 1112

ADMINISTRATIVE PERSONNEL
Review of Circumstances of the Mass Removal of Statutory Inspectors General.
AD-A107 189/3 1108

ADRENAL METABOLISM
Participation of the Hypophyseal-Adrenal Cortex System in Thrombin Clearance During Immobilization Stress.
N82-11760/7 1144

ADRENOCORTICOTROPIN (ACTH)
Participation of the Hypophyseal-Adrenal Cortex System in Thrombin Clearance During Immobilization Stress.
N82-11760/7 1144

ADVECTION
A Two-Dimensional Finite Element Advection Model with Variable Resolution.
AD-A107 511/8 1086

AERIAL DELIVERY
The Air-Launched Balloon System (ALBS) Phase II Design Improvement and Test Program.
AD-A107 214/9 1077

AERIAL PHOTOGRAPHY
Determination of the Relationship between Information Capacity and Identification by Simulated Aerial Photography.
AD-A107 485/5 1230

AEROACOUSTICS
Aeroacoustic Theory for Noncompact Wing-Gust Interaction.
N82-11071/9 1078

AERODYNAMIC CHARACTERISTICS
Effects of Vortex Flaps on the Low-Speed Aerodynamic Characteristics of an Arrow Wing.
N82-11013/1 1077

The Effects of Lateral Aerodynamic Uncertainties on the Handling Qualities of the Space Shuttle Orbiter at Mach Numbers of 1.5 and .6.
N82-11051/1 1272

AERODYNAMIC COEFFICIENTS
Wind-Tunnel Results for a Modified 17-Percent-Thick Low-Speed Airfoil Section.
N82-11033/9 1076

AERODYNAMIC CONFIGURATIONS
Aeroacoustic Theory for Noncompact Wing-Gust Interaction.
N82-11071/9 1078

AERODYNAMIC CONTROL SURFACES
Wind Tunnel Test of a Self-Optimizing Flexible Technology Wing.
AD-A106 926/9 1077

AERODYNAMIC FORCES
Prediction of Aerodynamic Forces on a Circular Cylinder and a Thin Airfoil in a Transonic Airstream by the Finite Element Method.
AD-A107 201/6 1076

An Influence Coefficient Method for the Application of the Modal Technique to Wing Flutter Suppression of the Dast Arw-1 Wing.
N82-11070/1 1078

AERODYNAMIC NOISE
Aircraft Wing Trailing-Edge Noise.
N82-11039/6 1076

AERODYNAMICS
Vibrational Analysis in Aerodynamics. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
PB82-858531 1076

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PB82-858549 1076

Vibrational Analysis in Aerodynamics. 1970-1981 (Citations from the NTIS Data Base).
PB82-858556 1076

AERONAUTICAL ENGINEERINGUNIVERSITIES
A Technical Assessment of Aeronautical Engineering in Israel.
AD-A106 980/6 1075

AERONAUTICS
Report of the President's Task Force on Aircraft Crew Complement,
AD-A106 889/9 1106

AERONOMY
Geomagnetic Observations.
N82-11693/0 1085

AEROSOLS
An Aerosol Data Base Format.
AD-A107 032/5 1083

Aerosol Composition in the Marine and Coastal Boundary Layer.
AD-A107 308/9 1084

Ionization and Aerosol Particulates in the Middle Atmosphere.
AD-A107 361/8 1084

Beta-Gauge Methods Applied to Aerosol Samples.
LBL-9128 1241

Improved Simulation of Aerosol, Cloud, and Density Measurements by Shuttle Lidar.
N82-11688/0 1085

Aerosol Sampling Inlets and Inhalable Particles.
PB82-132473 1212

Aerosol Formation in Urban Plumes.
PB82-132580 1212

Chemical Analysis of Aerosols and Airborne Particulates. 1977-June, 1980 (Citations from the NTIS Data Base).
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Chemical Analysis of Aerosols and Airborne Particulates. July, 1980-November, 1981 (Citations from the NTIS Data Base).
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AEROSPACE INDUSTRY
Proceedings, U.S. Department of Commerce Public Workshop on Critical Materials Needs in the Aerospace Industry, February 9-10, 1981,
PB82-137266 1193

AFFIRMATIVE ACTION
EEO System.
PB82-121914 1109

EEO Statistics. Computer Operation Manual.
PB82-121922 1109

AGING (MATERIALS)
Survey on Aging on Electrodes and Electrocatalysts in Phosphoric Acid Fuel Cells.
N82-11545/2 1186

AGRIBUSINESS
Poultry Production, Disposition, and Income: Final Estimates for 1976-79.
PB82-133430 1080

An Evaluation of Farmers Home Administration's Economic Emergency Loan Program Objectives to Determine the Programs Effectiveness and the Need for the Program.
PB82-134727 1092

AGRICULTURAL ECONOMICS
Risk and Allocative Errors Due to Imperfect Information: The Impact on Wheat Technology in Tunisia.
PB82-134552 1080

AGRICULTURAL MACHINERY
Cooperative Farm Machinery Operations: Oregon and Wisconsin,
PB82-134123 1080

AGRICULTURAL WASTES
Design, Construction, and Operation of a Full Scale Experimental Anaerobic Fermentation Facility. Final Report.
DE81029028 1266

Technology Assessment of Solar Energy Systems: Potential Soil Erosion Effects of Harvesting Crop Residues for Energy Production.
DE82000149 1181

Interactive Model to Assess Economics of Anaerobic Digestion on the Farm.
DE82000452 1267

AGRICULTURE
Food in the Future: Proceedings of a Planning Symposium.
AD-A107 145/5 1079

Irrigation Market for Solar Thermal Parabolic Dish Systems.
N82-11549/4 1182

Bibliography of Scientific Literature on Sri Lanka and by Sri Lankan Scientists Relating to Agriculture, Forestry, Veterinary Sciences and Fisheries, 1960-1978: Volume I,
PB82-138165 1081

Bibliography of Scientific Literature on Sri Lanka and by Sri Lankan Scientists Relating to Agriculture, Forestry, Veterinary Sciences and Fisheries, 1960-1978: Volume II,
PB82-138173 1081

AGRISTARS PROJECT
Evaluation of Gravimetric Ground Truth Soil Moisture Data Collected for the Agricultural Soil Moisture Experiment, 1978 Colby, Kansas, Aircraft Mission.
N81-29494/4 1169

Development of Advanced Acreage Estimation Methods.
N81-29495/1 1156

Evaluation of Multiband, Multitemporal, and Transformed Landsat Mss Data for Land Cover Area Estimation.
N81-29496/9 1080

The Multicategory Case of the Sequential Bayesian Pixel Selection and Estimation Procedure.
N81-29498/5 1198

Nationwide Forestry Applications Program. Analysis of Forest Classification Accuracy.
N81-29499/3 1081

Soil Moisture Inferences from Thermal Infrared Measurements of Vegetation Temperatures.
N81-29500/8 1169

Conversion of Spu-Universal Disk File to Jsc-Universal Tape Storage: Convrt User's Guide.
N81-29501/6 1174

Maximum Likelihood Clustering with Dependent Feature Trees.
N81-29502/4 1198

New Output Improvements for Classy.
N81-29503/2 1080

Users Manual for the US Baseline Corn and Soybean Segment Classification Procedure.
N81-29504/0 1080

Descriptive and Sensitivity Analyses of Watbali: A Dynamic Soil Water Model.
N81-29507/3 1170

Evaluation of Spring Wheat and Barley Crop Calender Models for the 1979 Crop Year.
N81-29508/1 1081

Estimation of Proportions in Mixed Pixels Through Their Region Characterization.
N81-29510/7 1198

AIR

Acceleration of Methane-Air Ignition by Hydrocarbon Additives.
AD-A107 009/3 1272

AIR CIRCULATION

Air Exchange Measurements in a High Rise Office Building.
PB82-133984 1226

Development and Field Verification of a Model of House Air Infiltration for Single Family Residences.
PB82-141110 1226

AIR CONDITIONERS

Saving Half of California's Energy and Peak Power in Buildings and Appliances Via Long-Range Standards and Other Legislation.
LBL-6865 1182

AIR DEFENSE

Missile Safety Qualification of Short Range Air Defense (SHORAD) Missiles.
AD-A107 505/0 1232

AIR-EARTH INTERFACES

Atmospheric Benzene Depletion by Soil Microorganisms.
PB82-126293 1170

AIR EXCHANGE

Air Exchange Measurements in a High Rise Office Building.
PB82-133984 1226

AIR FILTERS

Air Filtration and Purification. 1976-1981 (Citations from the Energy Data Base).
PB82-858978 1203

AIR FLOW

Analytical and Experimental Study of Flow Phenomena in Noncavitating Rocket Pump Inducers.
N82-11031/3 1270

AIR FORCE FACILITIES

Installation Restoration Program Records Search for Langley Air Force Base, Virginia.
AD-A106 864/2 1203

Geothermal Potential on Kirtland Air Force Base Lands, Bernalillo County, New Mexico.
AD-A107 044/0 1157

AIR FORCE PERSONNEL

Performance as a Factor in Enlisted Promotions.
AD-A107 298/2 1108

USAF Food Habits Study. Part IV. Selections, Quantities Selected, and Perceived Portion Sizes.
AD-A107 307/1 1137

AIR FORCE PLANNING

Mission Impact Generalized Explanatory Base Operating Support Model Development: Final Management Summary.
AD-A107 277/6 1089

AIR FORCE PROCUREMENT

Allocation of an Air Force Contractor's Pension Fund Assets May be Inequitable.
AD-A107 375/8 1090

Implementation of Subcontracting Provisions of Public Law 95-507 within Air Force Logistics Command and Air Force Systems Command.
AD-A107 450/9 1090

Determination of Contract Suitability to the Award Fee Concept.
AD-A107 465/7 1090

Military Contractor-Operated Stores' Contracts are Unmanageable and Vulnerable to Abuse.
AD-A107 499/6 1231

AIR FORCE SYSTEMS COMMAND

Questionable Use of the C-X and Other Air Force Weapon System Funds.
AD-A106 898/0 1231

AIR FORCE TRAINING

Air War College Class of 1981 Retention Survey.
AD-A107 103/4 1107

Airborne Communication Systems Career Ladder, AFSC 294X0.
AD-A107 472/3 1109

Fuels Career Ladder AFSC 631X0.
AD-A107 473/1 1109

AIR INFILTRATION

Development and Field Verification of a Model of House Air Infiltration for Single Family Residences.
PB82-141110 1226

AIR INTAKES

Low Speed Testing of the Inlets Designed for a Tamden-Fan V/STOL Nacelle.
N82-11042/0 1077

AIR INTERCEPT CONTROLLER

Behavioral Objectives for Air Intercept Controller Prototype Training System.
AD-A107 001/0 1106

AIR LAUNCHED

The Air-Launched Balloon System (ALBS) Phase II Design Improvement and Test Program.
AD-A107 214/9 1077

AIR POLLUTION

Control of Air Pollution from Aviation: The Emission Standard Setting Process.
AD-A107 435/0 1208

Modeling a Multiple Tracer Release Experiment During Nocturnal Drainage Flow in Complex Terrain.
DE81024414 1086

Overview, Current Status, and Future Plans for the DOE Atmospheric Studies in Complex Terrain (ASCOT) Program.
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Shuttle Applications in Tropospheric Air Quality Observations.
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PB82-107723 1210

Questions and Responses at the 1981 Workshops on Procedures to Demonstrate Attainment of the NAAQS (National Ambient Air Quality Standards) for Ozone in the 1982 SIPs (State Implementation Plans).
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Permit Fee Guideline.
PB82-107871 1210

Tethered Balloon Sampling Systems for Monitoring Air Pollution.
PB82-126319 1210

Nitrosamines and Other Hazardous Emissions from Engine Crankcases.
PB82-127960 1210

Aerosol Sampling Inlets and Inhalable Particles.
PB82-132473 1212

Aerosol Formation in Urban Plumes.
PB82-132580 1212

Scavenging of Aerosol Particles by Precipitation.
PB82-134404 1213

Development of Fuel Cell Gas Detection Instruments for Use in a Mine Atmosphere.
PB82-137316 1229

High Concentration Dust Monitor.
PB82-139320 1229

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Pollution Caused by Ammunition Manufacturing. 1964-November, 1981 (Citations from the NTIS Data Base).
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Remote Sensing Applied to Environmental Pollution Detection and Management. 1964-November, 1981 (Citations from the NTIS Data Base).
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Air Filtration and Purification. 1976-1981 (Citations from the Energy Data Base).
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Acid Precipitation. June, 1976-December, 1981 (Citations from the Energy Data Base).
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AIR POLLUTION ABATEMENT

Zeolites in Catalysis. 1976-1981 (Citations from the Energy Data Base).
PB82-859505 1269

AIR POLLUTION CONTROL

Comparative Cost Estimates of Five Coal Utilization Processes.
ORNL/Sub-7384/1 1209

Current Status of EPA Office of Mobile Source Air Pollution Control Characterization Projects: Summary.
PB82-105909 1269

An Analysis of the Scope of Federal Laws and Regulations Controlling Exposures to Substances Which Cause Occupational Respiratory and Pulmonary Diseases.
PB82-134198 1103

Controlling Nitrogen Oxides.
PB82-139049 1215

Waste Processing and Pollution in the Chemical and Petrochemical Industries. 1976-June, 1980 (Citations from the NTIS Data Base).
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Waste Processing and Pollution in the Chemical and Petrochemical Industries. July, 1980-November, 1981 (Citations from the NTIS Data Base).
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Dust Control in Pulp/Paper Mills. 1976-1981 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
PB82-859273 1196

AIR POLLUTION CONTROL EQUIPMENT

Improvement of Hot-Side Precipitator Performance with Sodium Conditioning--An Interim Report.
PB82-134107 1213

AIR POLLUTION DETECTION

Chloroacetaldehyde (Analytical Method S11).
PB82-107244 1140

AIR POLLUTION EFFECTS (PLANTS)

Effects of Acid Precipitation in North America.
PB82-128117 1138

AIR POLLUTION SAMPLING

Chloroacetaldehyde (Analytical Method S11).
PB82-107244 1140

AIR QUALITY

SIMPLEX 'A' - A Simplified Atmospheric Dispersion Model for Airport Use (Users Guide).
AD-A107 320/4 1205

Air Quality Regulation in Spatial Equilibrium Models.
LA-UR-80-1753 1209

Shuttle Applications in Tropospheric Air Quality Observations.
N82-11635/1 1209

Tethered Balloon Sampling Systems for Monitoring Air Pollution.
PB82-126319 1210

Analyses, Experimental Studies, and Evaluations of Control Measures for Air Flow and Air Quality on and Near Highways. Volume I: Experimental Studies, Analyses, and Model Development.
PB82-133604 1213

AIR SPACE

AUTOPILOT: A Distributed Planner for Air Fleet Control.
AD-A107 139/8 1236

AIR TRAFFIC CONTROL SYSTEMS

Controller Staffing and Training at Four FAA Air Traffic Control Facilities.
AD-A106 831/1 1105

Review of Department of Transportation's Response to Recommendations in the Senate Report on the Federal Aviation Administration's En Route Air Traffic Control Computer System.
AD-A106 850/1 1236

AUTOPILOT: A Distributed Planner for Air Fleet Control.
AD-A107 139/8 1236

Standard Engineering Installation Package. Air Traffic Radio Channel Control Equipment Change 1.
AD-A107 150/5 1236

Marine Air Traffic Control and Landing System (MATCALS) Investigation.
AD-A107 384/0 1237

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AD-A107 396/4 1237

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AD-A107 507/6 1237

AIR TRAFFIC CONTROLLERS

Controller Staffing and Training at Four FAA Air Traffic Control Facilities.
AD-A106 831/1 1105

Prototype Equipment Student Guide for ACE (Air Intercept Controller Prototype Training System).
AD-A106 999/6 1106

Ordinal Syllabus for Air Intercept Controller Prototype Training System.
AD-A107 000/2 1106

AIR TRANSPORTABLE EQUIPMENT

Cold Regions Testing of an Air-Transportable Shelter.
AD-A107 131/5 1226

AIR WATER INTERACTIONS

Covariance Functions and Related Statistical Properties of Acoustic Backscattering from a Randomly Rough Air-Water Interface.
AD-A107 169/5 1252

AIRBRAKES

Properties of Antilock Systems: Descriptive Parameters Used in Analyzing the Braking and Handling of Heavy Trucks. Volume 5.
PB82-133273 1221

AIRCRAFT

Aircraft Alerting Systems Standardization Study. Volume I. Candidate System Validation and Time-Critical Display Evaluation.
AD-A107 225/5 1079

AIRCRAFT ANTENNAS

General Aviation Aircraft Antennas for the Global Positioning System.
N82-11339/0 1237

AIRCRAFT DESIGN

New Estimation Method for Flutter or Divergence Boundary from Random Responses at Subcritical Speeds.
N82-11034/7 1077

KEYWORD INDEX

AIRCRAFT ENGINES
Lightweight Diesel Engine Designs for Commuter Type Aircraft.
N82-11068/5 1271

JT8D High Pressure Compressor Performance Improvement.
N82-11467/9 1270

Integrated Analysis of Engine.
N82-11491/9 1078

AIRCRAFT FIRE CONTROL SYSTEMS
Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236

AIRCRAFT FUEL SYSTEMS
Experimental Study of Fuel Heating at Low Temperatures in a Wing Tank Model, Volume 1.
N82-11224/4 1268

AIRCRAFT FUELS
Experimental Study of Fuel Heating at Low Temperatures in a Wing Tank Model, Volume 1.
N82-11224/4 1268

AIRCRAFT HAZARDS
Selected Bibliography of Naca-NASA Aircraft Icing Publications.
N82-11053/7 1078

AIRCRAFT INTERCEPT CONTROL SYSTEMS
Prototype Equipment Student Guide for ACE (Air Intercept Controller Prototype Training System).
AD-A106 999/6 1106

Ordinal Syllabus for Air Intercept Controller Prototype Training System.
AD-A107 000/2 1106

AIRCRAFT INTERCEPTION
Behavioral Objectives for Air Intercept Controller Prototype Training System.
AD-A107 001/0 1106

AIRCRAFT NOISE
Aeroacoustic Theory for Noncompact Wing-Gust Interaction.
N82-11071/9 1078

Effects of Aircraft Noise on the Equilibrium of Airport Residents: Testing and Utilization of a New Methodology.
N82-11636/9 1112

Helicopter Rotor Trailing Edge Noise.
N82-11859/7 1078

Airport Noise. 1964-October, 1981 (Citations from the NTIS Data Base).
PB82-802364 1217

AIRFOIL PROFILES
Wind-Tunnel Results for a Modified 17-Percent-Thick Low-Speed Airfoil Section.
N82-11033/9 1076

Aeroacoustic Theory for Noncompact Wing-Gust Interaction.
N82-11071/9 1078

AIRFOILS
Prediction of Aerodynamic Forces on a Circular Cylinder and a Thin Airfoil in a Transonic Airstream by the Finite Element Method.
AD-A107 201/6 1076

AIRLIFT OPERATIONS
Optimal Staging and Scheduling in Airlift Operations.
AD-A107 518/3 1231

AIRPORT RADAR SYSTEMS
TRACALS Evaluation Report. Airport Surveillance Radar AN/GPN-12. Special Evaluation Report. Salt lake City International Airport and Wendover Auxiliary Airfield, Utah, 3 and 6-15 June 1981.
AD-A107 234/7 1237

TRACALS Evaluation Report. Airport Surveillance and Precision Approach Radar AN/GPN-24(V), Initial Evaluation Report, RAF Upper Heyford, England 11 Mar-25 April 81.
AD-A107 491/3 1237

AIRPORTS
Effects of Aircraft Noise on the Equilibrium of Airport Residents: Testing and Utilization of a New Methodology.
N82-11636/9 1112

Airport Noise. 1964-October, 1981 (Citations from the NTIS Data Base).
PB82-802364 1217

AIRSPEED INDICATORS
A True Air Speed Sensor for Miniature Unmanned Aircraft.
AD-A106 967/3 1079

ALABAMA
Aerial gamma Ray Amd Magnetic Survey: Mississippi and Florida Survey, Meridian Quadrangle of Mississippi and Alabama. Final Report.
GJBX-154(80) 1163

Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Hattiesburg Quadrangle of Mississippi, Alabama, and Louisiana. Final Report.
GJBX-155(80) 1163

ALASKA
Airborne gamma-Ray Spectrometer and Magnetometer Survey: Harrison Bay Quadrangle, Alaska. Final Report, Volume 1.
DE82000338 1161

Alaska: A Guide to Geothermal Energy Development.
DOE/ET/28476-T2 1162

National Hydroelectric Power Resources Study. Preliminary Inventory of Hydropower Resources. Volume 1. Pacific Northwest Region.
DOE/RA/11025-T1(V.1) 1186

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Norton Bay Quadrangle (Alaska). Final Report.
GJBX-72(80)(V.1) 1164

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Nulato Quadrangle (Alaska). Final Report.
GJBX-73(80)(V.1) 1164

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Medfra Quadrangle (Alaska). Final Report.
GJBX-76(80)(V.1) 1164

Airborne gamma-Ray Spectrometer and Magnetometer Survey: McGrath Quadrangle (Alaska). Final Report.
GJBX-77(80)(V.1) 1164

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Ophir Quadrangle (Alaska). Final Report.
GJBX-78(80)(V.1) 1164

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Sleetmute Quadrangle (Alaska). Final Report.
GJBX-79(80)(V.1) 1164

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Sleetmute Quadrangle (Alaska). Final Report.
GJBX-79(80)(V.2) 1164

ALASKA GAS PIPELINE
Cost Variance Analysis of Certification Cost Estimate for Alaska Segment of ANGTS.
PB82-134313 1269

ALBEDO
Computation of Averaged Monthly Zonal Albedo Utilizing the Solar Zenith Angle, Properties of Clear and Cloudy Atmospheres.
N82-12010/6 1082

ALCOHOL ABUSE
Fetal Alcohol Syndrome. 1976-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859943 1135

ALCOHOLIC BEVERAGE
A Study of Metric Conversion of Distilled Spirits Containers: A Policy and Planning Evaluation: Task I. Comprehensive Report on the Conversion Process,
PB82-134396 1099

ALCOHOLIC BEVERAGES
The Marketing of Alcoholic Beverages. Phase II: An Analytical Framework for Information About Marketing Practices and Consumer Purchasing of Beverage Alcohol Products,
PB82-135278 1099

The Marketing of Alcoholic Beverages. Phase I: Literature Report,
PB82-135286 1099

Marketing Practices in the Alcoholic Beverages Industry: Toward an Understanding of How Macro-Environmental Forces Shape Marketing Strategies in the Alcoholic Beverage Industry. A Supplement to Phases I and II,
PB82-138579 1100

ALCOHOLISM
The National Institute on Alcohol Abuse and Alcoholism Should Make Greater Efforts to Support Treatment Demonstration Projects.
AD-A107 194/3 1123

Fetal Alcohol Syndrome. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859943 1135

ALCOHOLS
Effects of Alcohol Fuels on Engine Wear.
AD-A107 136/4 1266

Development of Catalytic Systems for the Conversion of Syngas to Jet Fuel and Diesel Fuel and Higher Alcohols. Annual Report.
DE82000067 1151

ALDOXIMES
Determination of N-Methyl Pyridinium-2-Aldoxime Chloride and Its Hydrolytic By-Products by Ion-Pair High-Performance Liquid Chromatography.
AD-A106 962/4 1141

ALGAE
Laser Induced Fluoroescence from Algae: Results of a Ship-Borne Field Test.
N82-11758/1 1121

ALGEBRA
Proceedings of the ACM Symposium on Symbolic and Algebraic Computation (1981), Snowbird, Utah, 5-7 August 1981.
AD-A107 464/0 1197

ALGORITHMS
Cluster Analysis Algorithms for Image Segmentation.
AD-A107 110/9 1172

A New Algorithm for Two-Dimensional Maximum Entropy Power Spectrum Estimation.
AD-A107 123/2 1178

Deductive Synthesis of the Unification Algorithm,
AD-A107 328/7 1173

Maximum Likelihood Estimation of Magnitude-Squared Coherence.
AD-A107 352/7 1197

A Distributed Algorithm for Minimum Weight Directed Spanning Trees.
AD-A107 462/4 1173

Block Relaxation Strategies.
LA-UR-80-2342 1197

Algorithm for Fuel Conservative Horizontal Capture Trajectories.
N82-11018/0 1076

An Algorithm for Minimum-Cost Set-Point Ordering in a Cryogenic Wind Tunnel.
N82-11090/9 1228

Modulation/Demodulation Techniques for Satellite Communications. Part 4: Appendices.
N82-11341/6 1234

SMMR Data Set Development for GARP.
N82-11512/2 1085

Thermal Algorithms Analysis.
N82-11800/1 1174

A Second-Order Accurate Procedure for Solving the Boundary Layer Equations Based on the Predictor-Corrector Form of the Crank-Nicolson Scheme.
N82-11826/6 1198

ALKALI METALS
Phonons in Alkali Graphite Intercalation Compounds.
DE82000059 1151

ALKALOIDS
Antisecretory Effects of Berberine in Rat Ileum.
AD-A106 953/3 1141

ALLOCATIONS
Environmental Assessment: Allocation of Petroleum Feedstock, Columbia LNG Corporation, Green Springs SNG Plant, Green Springs, Seneca County, Ohio.
DOE/EA-0061 1209

ALLOWANCES
Codebook for the Household Survey, Site I, Wave 3. Housing Assistance Supply Experiment,
PB82-144908 1119

Audit of the Survey of Residential Buildings, Site I, Wave 3. Housing Assistance Supply Experiment,
PB82-144932 1119

Audit of the Survey of Residential Buildings, Site I, Wave 2. Housing Assistance Supply Experiment,
PB82-144940 1119

Housing Allowance Demand Experiment: Final Report,
PB82-145020 1119

ALLOY-A-286
Thermophysical Properties of Selected Wear-Resistant Alloys.
HEDL-TME-79-6 1192

ALLOY-HT-9
Effect of Microstructure on the Mechanical Properties of a Commercial 12Cr-1Mo Steel (HT-9).
DE82000082 1248

ALLOY PLATING
Alloy Electrodeposition. 1970-1981 (Citations from the NTIS Data Base).
PB82-858960 1223

ALLOYING
Alloying Effects of Tungsten. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-858572 1193

ALOSA SAPIDISSIMA
Handling and Transporting Juvenile American Shad,
PB82-136615 1121

ALPHAVIRUSES
A Multidisciplinary Program of Infectious Disease Surveillance along the Transamazon Highway in Brazil: Epidemiology of Arbovirus Infections.
AD-A107 008/5 1123

ALUMINIUM
Survey of Matrix Materials for Solidified Radioactive High-Level Waste.
DE82000708 1244

1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix B: Cost Study, High-Purity Aluminum Production.
LA-7885-MS(V.3) 1188

Post Irradiation Dose Determination of 800 MeV Proton Irradiated Aluminum from LAMPF Experiment 407.
LA-8351-MS 1192

Aluminum Particle Surface Studies in Al/Cu sub 2 O by Electron Spectroscopy for Chemical Analysis and Auger Electron Spectroscopy.
MLM-2664 1250

ALUMINIUM-AIR BATTERIES
Temperature and Concentration Transients in the Aluminum-Air Battery.
DE81030338 1188

ALUMINIUM ALLOYS
Erosion-Corrosion-Wear Program.
LBL-11109 1192

ALUMINIUM BASE ALLOYS
Erosion-Corrosion-Wear Program.
LBL-11109 1192

ALUMINIUM OXIDES
Coal Liquefaction Research, October 1, 1978-September 30, 1981.
DE81030379 1267

Diffusion of Gases in Capillaries.
DE82000267 1253

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LBL-11030 1249

Erosion-Corrosion-Wear Program.
LBL-11109 1192

Materials Analyses of Ceramics for Glass Furnace Recuperators.
ORNL/TM-6970 1190

ALUMINUM
Improvements in Department of the Interior Leasing of Potential Aluminum Resources Are Necessary for More Timely Decisionmaking.
AD-A106 886/5 1191

Follow-up Report on Domestic Aluminum Resources: Dilemmas of Development.
AD-A106 901/2 1191

Standard Specification for Light Ladders.
N82-11277/2 1218

Brain Destruction Alone Does Not Elevate Brain Aluminum.
PB82-133968 1132

Anisotropic Elastic Constants of a Fiber-Reinforced Boron-Aluminum Composite.
PB82-134016 1191

Anodizing Aluminum. 1974-1981 (Citations from the International Aerospace Abstracts Data Base).
PB82-859299 1223

ALUMINUM ALLOYS
Flaw Growth of 7075, 7475, 7050 and 7049 Aluminum Alloy Plate in Stress Corrosion Environments: 4-Year Marine Atmosphere Results.
N82-11181/6 1192

ALZHEIMERS DISEASE
Brain Destruction Alone Does Not Elevate Brain Aluminum.
PB82-133968 1132

AMBIENT TEMPERATURE
Categorization of Nocturnal Drainage Flows in the Anderson Creek Valley.
DE81024374 1086

AMBULATORY HEALTH CARE
Method for Continuous Ambulatory Peritoneal Dialysis.
PATENT-4 239 041 1140

AMENORRHEA
Clinical Analysis of 120 Cases of Primary Amenorrhea.
PB82-136037 1133

AMERICAN INDIANS
Review of the Navajo and Hopi Indian Relocation Commission's Program.
AD-A106 836/0 1113

AMERICAN SHAD
Handling and Transporting Juvenile American Shad.
PB82-136615 1121

AMERICIUM
Applications of DHDECMP Extraction Chromatography to Nuclear Analytical Chemistry.
DE81030134 1150

AMERICIUM 241
Status of exp 241 Am Recovery and Purification at Los Alamos Scientific Laboratory.
LA-UR-80-2414 1240

AMINES
Competitive Pathways in Chlorine Dioxide Oxidation of Amines: Amide Formation from Acyclic Amines.
AD-A107 242/0 1147

Method of Neutralizing the Corrosive Surface of Amine-Cured Epoxy Resins.
PAT-APPL-6-293 412 1195

Nitrosamines and Other Hazardous Emissions from Engine Crankcases.
PB82-127960 1210

AMMONIA
Health Hazard Evaluation Report No. HE-80-159-752 at Mountain Bell, Denver, Colorado,
PB82-107236 1140

Effect of Fluctuating Exposures on the Acute Toxicity of Ammonia to Rainbow Trout (Salmo gairdneri) and Cutthroat Trout (S. clarki).
PB82-128158 1145

AMMUNITION
The Navy Must Improve Its Accountability for Conventional Ammunition.
AD-A107 174/5 1230

AMMUNITION COMPONENTS
Ammunition Characteristics.
AD-A107 311/3 1250

AMORPHOUS MATERIALS
Theoretical and Experimental Investigation of the Dynamics of Pulsed Laser Annealing of Amorphous Silicon.
AD-A106 855/0 1262

AMPHIBIOUS ASSAULT SHIPS
Planning Amphibious Lift Forces. Appendix. Amphibious Ship Capacity Handbook.
AD-A106 949/1 1224

ANAEROBIC DIGESTION
Interactive Model to Assess Economics of Anaerobic Digestion on the Farm.
DE82000452 1267

ANALOG CIRCUITS
Tuned Analog Network.
PAT-APPL-6-301 077 1179

ANALOG SYSTEMS
MNOS/CCD Nonvolatile Analog Memory.
AD-A107 229/7 1172

ANALYSIS OF VARIANCE
Applications of Non-Parametric Statistics and Analysis of Variance on Sample Variances.
N82-11834/0 1198

ANALYTICAL CHEMISTRY
Competitive Pathways in Chlorine Dioxide Oxidation of Amines: Amide Formation from Acyclic Amines.
AD-A107 242/0 1147

ANALYTICAL METHODS
Chloroacetaldehyde (Analytical Method S11).
PB82-107244 1140

ANDROSCOGGIN RIVER BASIN
Androscoggin River Basin Overview.
PB82-107137 1160

ANEMOMETERS
Hot-Wire and Hot-Film Anemometers.
AD-A107 213/1 1228

Hot Film Anemometry. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802471 1229

ANGULAR MOMENTUM
Variations in Atmospheric Angular Momentum.
N82-11690/6 1085

ANIMAL ECOLOGY
Marine Bird Populations of the Strait of Juan de Fuca, Strait of Georgia and Adjacent Waters in 1978 and 1979.
PB82-132622 1155

Susquehanna River Anadromous Fish Studies, Conowingo Dam to Havre De Grace, Maryland.
PB82-135963 1121

ANIMAL FEEDS
Design, Construction, and Operation of a Full Scale Experimental Anaerobic Fermentation Facility. Final Report.
DE81029028 1266

ANIMALS
Convention on International Trade in Endangered Species of Wild Fauna and Flora; 1979 Annual Report for the United States of America.
PB82-128646 1098

ANISOLE
Effect of Antibody to Anisole Binding Protein on Odorant Perturbation of Na(+) -K(+) ATPase Activity.
AD-A107 162/0 1142

ANISOTROPIC PLATES
An Improved Transverse Shear Deformation Theory for Laminated Antisotropic Plates.
N82-11488/5 1262

ANL
Radiological and Environmental Research Division Annual Report, January-December 1980: Ecology.
DE82000154 1136

ANNEALING
Theoretical and Experimental Investigation of the Dynamics of Pulsed Laser Annealing of Amorphous Silicon.
AD-A106 855/0 1262

Transient Annealing of Arsenic-Implanted Silicon Using a Graphite Strip Heater.
AD-A107 230/5 1222

Processing of Silicon Solar Cells by Ion Implantation and Laser Annealing.
N82-11546/0 1186

ANNUAL CYCLE ENERGY SYSTEM
Theory and Design of an Annual Cycle Energy System (ACES) For Residences.
ORNL/CON-43 1201

Economic Evaluation of the Annual Cycle Energy System (ACES). Final Report. Volume III, Appendices.
ORNL/Sub-7470/1-V3 1183

ANNUAL VARIATIONS
Time-Variable Earth's Albedo Model Characteristics and Applications to Satellite Sampling Errors.
N82-11723/5 1085

ANODIZING
Anodizing Aluminum. 1974-1981 (Citations from the International Aerospace Abstracts Data Base).
PB82-859299 1223

ANTARCTIC REGIONS
Marine Sediment Core Descriptions IWSOE 68, 69, 70; Deep Freeze 79,
PB82-132127 1158

The Scientific Program USCGC Glacier Deep Freeze 80,
PB82-132879 1159

USCGC GLACIER 1976 and 1978 Cruises. Rose Sea, Antarctica Sediment Descriptions,
PB82-134503 1159

ISLAS ORCADAS Cruise 16, April-May 1978. Hydrographic Stations 178-250.
PB82-140195 1168

ANTENNA APERTURES
Electromagnetic Transmission through a Rectangular Aperture in a Perfectly Conducting Plane.
AD-A107 521/7 1264

ANTENNA ARRAYS
Performance Advantage of Complex LMS Controlling Narrow-Band Adaptive Arrays.
AD-A107 231/3 1178

ANTENNA CONFIGURATIONS
Cross Correlation in a Space-Diversity System on a Military Vehicle.
AD-A107 114/1 1178

ANTENNA DESIGN
General Aviation Aircraft Antennas for the Global Positioning System.
N82-11339/0 1237

ANTENNA FEEDS
Space-Based Radar Array System Simulation and Validation.
AD-A106 996/2 1238

Focal Axis Resolver for Offset Reflector Antennas.
PAT-APPL-6-308 009 1179

ANTENNA RADIATION PATTERNS
Final Electromagnetic Test Report for the M10-76-8000 Radome with XP Plates.
AD-A107 404/6 1238

Antenna Pattern Modification for Single Reflector Antennas.
N82-11338/2 1264

ANTHRACENE
Synchronous Fluorescence/Matrix Isolation Method for Trace Organic Analysis. Progress Report, July 1980-July 1981.
DE81030958 1150

ANTIBACTERIAL AGENTS
Preferential Inhibition of Ribonucleic Acid Synthesis by a New Thiosemicarbazone Possessing Antibacterial and Antiparasitic Properties.
AD-A106 951/7 1141

ANTIBARYONS
Hadron Production in Quark Combination with Colors.
JINR-R-2-12154 1258

ANTIBODIES
Colostrum: Immunological Aspects. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859588 1135

ANTIDOTES
Determination of N-Methyl Pyridinium-2-Aldoxime Chloride and Its Hydrolytic By-Products by Ion-Pair High-Performance Liquid Chromatography.
AD-A106 962/4 1141

ANTIGEN
Studies on the Rapid Detection of Dengue Virus Antigen by Immunofluorescence and Radioimmunoassay.
PB82-136052 1133

ANTIICING ADDITIVES
Icing Tunnel Tests of a Composite Porous Leading Edge for Use with a Liquid Anti-Ice System.
N82-11052/9 1078

ANTILOCK BRAKE SYSTEMS
Properties of Antilock Systems: Descriptive Parameters Used in Analyzing the Braking and Handling of Heavy Trucks. Volume 5.
PB82-133273 1221

ANTIMALARIALS
Preferential Inhibition of Ribonucleic Acid Synthesis by a New Thiosemicarbazone Possessing Antibacterial and Antiparasitic Properties.
AD-A106 951/7 1141

2-Acetylpyridine Thiosemicarbazones. 3. Selenium Analogs as Potential Antimalarial Agents.
AD-A106 958/2 1141

ANTIMONY ALLOYS
Magnetic Susceptibility of Curium Pnictides.
DE82000148 1263

ANTIMONY COMPOUNDS
Experimental Work Related to Two Bismuth Sulfate Cycles and Their Possible Improvement. Outline of a Possible Antimonyl Sulfate Cycle with Separate Evolution of Sulfur Dioxide and Oxygen.
DE81030236 1267

ANTIRECOIL PLATE
Muzzle Flow in the Presence of an Anti-Recoil Plate: Exploratory Study.
AD-A107 314/7 1251

ANTITANK AMMUNITION
Effectiveness Testing for Antipropagation Shields Developed for M456 Heat Tank Ammunition.
AD-A107 037/4 1250

ANTITANK MISSILES
Simulated Tank Anti-Armor Gunnery System (STAGS).
AD-A107 481/4 1251

KEYWORD INDEX

APARTMENT BUILDINGS
Passive-Solar Multi-Family Concepts.
DE82000456 1200

APPLIANCES
Saving Half of California's Energy and Peak Power in Buildings and Appliances Via Long-Range Standards and Other Legislation.
LBL-6165 1182

APPRAISAL
Corps of Engineers' Acquisition of Fish Hatchery Proves Costly
AD-A106 828/7 1079

APTITUDE TESTS
Procedures for Criterion Referenced Tailored Testing.
AD-A107 135/6 1111

AQUACULTURE
Culturing, Harvesting, and Grading 'Daphnia',
PB82-136300 1121

Intensive Culture of Walleye ('Stizostedion vitreum vitreum')
PB82-136391 1121

The Use of Self-Feeders in Fish Culture,
PB82-136425 1121

Handling and Transporting Juvenile American Shad,
PB82-136615 1121

Degassing Supersaturated Water for Fish Culture,
PB82-136623 1121

Decapsulation of Brine Shrimp ('Artemia salina') Cysts,
PB82-136631 1121

Controlled Large-Scale Hatching of Brine Shrimp, 'Artemia salina',
PB82-136649 1121

Electronically-Controlled Automatic Live-Food Feeder,
PB82-136656 1122

AQUATIC BIOLOGY
Report of an Amphipod Species New to Ohio: 'Gammarus minus' Say (Amphipoda: Gammaridae).
PB82-132457 1121

A New Species of 'Stenonema' (Ephemeroptera: Heptageniidae) from Eastern North America.
PB82-132465 1121

AQUATIC ORGANISMS
Biological Activity and Chemical Characteristics of Dredge Material from 10 Sites on the Upper Mississippi River,
AD-A107 276/8 1135

Review of Open Literature on Effects of Chlorine on Aquatic Organisms.
DE82000097 1145

AQUATIC PLANTS
Proceedings, 15th Annual Meeting, Aquatic Plant Control Research Planning and Operations Review, held 17-20 November 1980, Savannah, Georgia.
AD-A107 083/8 1155

AQUEDUCTS
Kielder Aqueduct Tunnels - Predicted and Actual Geology.
PB82-135302 1214

AQUIFER CHARACTERISTICS
Effect of Irrigation Pumping on the Ground-Water System in Newton and Jasper Counties, Indiana.
PB82-137688 1081

ARBITRATION
Digest of Labor Arbitration Awards in the Federal Service (Supplement No. 10).
PB82-128257 1109

ARC WELDING
Optimization of Performance of Arc Welding Using Fluxes in Welded Ship Structures from HY-100 and HY-130 KPSI.
AD-A107 341/0 1222

ARCH DAMS
National Dam Safety Program. North Lake Dam Number 3 (Inventory Number N.Y. 113), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 406/1 1206

ARCHAEOLOGY
Excavation of Eleven Archaic and Woodland Sites in the Divide-Cut Section of the Tennessee-Tombigbee Waterways, Tishomingo County, Mississippi.
AD-A107 143/0 1103

Cultural Resources Investigations at Redstone Arsenal, Madison County, Alabama. Volume I.
AD-A107 151/3 1103

Cultural Resources Investigations at Redstone Arsenal, Madison County, Alabama. Volume II.
AD-A107 152/1 1103

Archaeological Investigation in the Gainesville Lake Area of the Tennessee-Tombigbee Waterway. Volume IV. Biocultural Studies in the Gainesville Lake Area.
AD-A107 171/1 1103

Archaeological Salvage Excavations at the Tibbee Creek Site (22Lo600) Lowndes County, Mississippi.
AD-A107 172/9 1104

Radar Mapping, Archaeology, and Ancient Land Use in the Maya Lowlands.
N82-11514/8 1104

Project Lame 80F: A Cultural Resource Survey Around Boulder Beach, Echo Bay, Temple Bar and Cottonwood Cove in the Lake Mead National Recreation Area Clark County, Nevada and Mohave County, Arizona,
PB82-109364 1104

A Cultural Resource Survey of the Continental Shelf from Cape Hatteras to Key West. Volume I: Introduction and Physical Environment.
PB82-138215 1104

A Cultural Resource Survey of the Continental Shelf from Cape Hatteras to Key West. Volume II: Prehistoric Archaeology.
PB82-138223 1104

A Cultural Resource Survey of the Continental Shelf from Cape Hatteras to Key West. Volume III: Appendices.
PB82-138231 1104

A Cultural Resource Survey of the Continental Shelf from Cape Hatteras to Key West. Volume IV: Conclusions and Recommendations.
PB82-138249 1104

ARCHITECTURE (COMPUTERS)
Design Methodology and Development History of an ISO OSI Layered Architecture for the Canadian Broadcast Telidon System.
N82-11337/4 1234

ARGON
Mound Facility Activities in Chemical and Physical Research: July-December 1979.
MLM-2727 1240

ARID LANDS
The Environmental Vegetation Index: A Tool Potentially Useful for Arid Land Management.
N81-29505/7 1081

ARIZONA
Terminal Forecast Reference Notebook, Fresno Air Terminal, California.
AD-A107 434/3 1086

Nure Aerial gamma-Ray and Magnetic Reconnaissance Survey: Colorado-Arizona Area, Grand Canyon NJ 12-10 Quadrangle.
GJBX-35(80)(V.2) 1163

Development of Compatible State - SMSA Econometric Models.
PB82-133497 1099

Development of Compatible State - SMSA Econometric Models: Appendices.
PB82-133505 1099

ARKANSAS
Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Harrison Quadrangle, Missouri and Arkansas. Final Report.
GJBX-150(80) 1162

ARMY BUDGETS
Budgetary Pressures Created by the Army's Plans to Procure New Major Weapon Systems are Just Beginning.
AD-A107 284/2 1089

ARMY CORPS OF ENGINEERS
Proceedings, 15th Annual Meeting, Aquatic Plant Control Research Planning and Operations Review, held 17-20 November 1980, Savannah, Georgia.
AD-A107 083/8 1155

ARMY OPERATIONS
Records Filing, Maintenance and Disposition Study for Department of the Army.
AD-A107 079/6 1094

ARMY PROCUREMENT
Inquiry Concerning Denial of Contracts to Low Offeror for Army Translation Services.
AD-A106 894/9 1088

Evaluation of the Army's Advanced Field Artillery Tactical Data System.
AD-A106 897/2 1251

Budgetary Pressures Created by the Army's Plans to Procure New Major Weapon Systems are Just Beginning.
AD-A107 284/2 1089

ARMY RESEARCH
US Army Institute of Surgical Research Annual Research Progress Report, FY 1980.
AD-A107 093/7 1123

ARMY TRAINING
Field Unit Readiness Study (FURS).
AD-A107 469/9 1109

The Army Racial Awareness Program: A Case Study of Program Impact on Personal Values.
AD-A107 535/7 1113

AROMATIC POLYCYCLIC HYDROCARBONS
The Certification of Polycyclic Aromatic Hydrocarbon Materials (PAH). Part II: The Six Methylchrysene Isomers (BRC Reference Materials No. 77, 78, 79, 80, 81 and 82),
PB82-138355 1153

ARROW WINGS
Effects of Vortex Flaps on the Low-Speed Aerodynamic Characteristics of an Arrow Wing.
N82-11013/1 1077

ARTEMIA SALINA
Controlled Large-Scale Hatching of Brine Shrimp, 'Artemia salina',
PB82-136649 1121

ARTIFICIAL INTELLIGENCE
Multiple-Agent Planning Systems.
AD-A107 219/8 1122

Inference Procedure with Uncertainty for Problem Reduction Method,
PB82-131772 1198

ARTILLERY
Utilization of Tactical Computers for Training: Field Evaluation Plan.
AD-A107 316/2 1108

Utilization of Tactical Computers for Training: Analysis of System and Training Requirements.
AD-A107 531/6 1109

ARTILLERY FIRE
Evaluation of the Army's Advanced Field Artillery Tactical Data System.
AD-A106 897/2 1251

ARTISTS
Artists' Spaces: A Study of the Development of Artists' Living and Working Space in Boston,
PB82-144650 1116

ARTS
Artists' Spaces: A Study of the Development of Artists' Living and Working Space in Boston,
PB82-144650 1116

ARYL RADICALS
Chemistry of Aryloxazolines. Applications to the Synthesis of Lignan Lactone Derivatives.
AD-A107 224/8 1147

ASBESTOS
Industrial Hygiene Survey Report at Celotex Corporation, Pittston, Pennsylvania.
PB82-107103 1139

Asbestos Dust and Preliminary Industrial Hygiene Survey at Wond-Bestos, the Firestone Tire and Rubber Company in New Castle, Indiana.
PB82-107178 1139

ASHES
Industrial Fuel Gas Demonstration Plant Program. Task II Report, Demonstration Plant Process Design. 2ND Issue.
FE-2582-13 1146

ASSEMBLY LANGUAGES
Patch Macro and Load Module (IRSPATCH).
PB82-121765 1174

ASSESSMENT
Scientific Research and Basic Needs of the People: A Method of Assessing Research Projects (Investigacion Cientifica Y Necesidades Basicas de la Poblacion: Un Metodo de Evaluacion de Proyectos),
PB82-135419 1092

ASSOCIATIVE PROCESSING
The Connection Machine (Computer Architecture for the New Wave).
AD-A107 463/2 1173

ASTRONAUT TRAINING
Hungarian Cosmonaut in Space.
N82-11097/4 1272

ASYMMETRY
A Wake Source Model for Asymmetric Potential Flow past Bodies of Wedge Shape.
N82-11036/2 1254

ATLANTIC OCEAN
Some Analysis on the Diurnal Variation of Rainfall over the Atlantic Ocean.
N82-11724/3 1087

St. Peter and St. Paul's Rocks (Equatorial Atlantic) and the Surrounding Sea Floor.
PB82-139403 1159

ATMOSPHERE MODELS
Topographically Induced Diurnal Boundary Layer Oscillations: Two Dimensional Synoptic Scale Modeling.
AD-A107 199/2 1086

ATMOSPHERIC CHEMISTRY
Aerosol Composition in the Marine and Coastal Boundary Layer.
AD-A107 308/9 1084

ATMOSPHERIC CIRCULATION
Variations in Atmospheric Angular Momentum.
N82-11690/6 1085

ATMOSPHERIC COMPOSITION
Far-Infrared Measurements of Trace Gases.
N82-11698/9 1228

ATMOSPHERIC DENSITY
Improved Simulation of Aerosol, Cloud, and Density Measurements by Shuttle Lidar.
N82-11688/0 1085

ATMOSPHERIC ELECTRICITY
First Annual Workshop on Aviation Related Electricity Hazards Associated with Atmospheric Phenomena and Aircraft Generated Inputs, February 26-27, 1980,
AD-A107 326/1 1077

ATMOSPHERIC HEAT BUDGET
Radiation Balances and the Solar Constant.
N82-12016/3 1085

ATMOSPHERIC HEATING
Meridional Heat Transport at the Onset of Winter Stratospheric Warming.
N82-11697/1 1085

ATMOSPHERIC MODELS
Improved Simulation of Aerosol, Cloud, and Density Measurements by Shuttle Lidar.
N82-11688/0 1085

ATMOSPHERIC MOTION
Atmospheric Turbulence as a Function of Height above Various Surface Materials.
AD-A107 034/1 1085

Efficient Radiative Transfer Computations in the Atmosphere.
AD-A107 289/1 1084

ATMOSPHERIC PRECIPITATION
The Debate over Acid Precipitation--Opposing Views--Status of Research.
AD-A106 925/1 1083

ATMOSPHERIC SCATTERING
Atmospheric Fluctuations Which Lead to Trackable Radar Signals in the Marine Boundary Layer.
AD-A107 523/3 1238

ATMOSPHERIC SOUNDING
Development of Instrumentation for Research Probes.
AD-A107 280/0 1086

ATOMIC COLLISIONS
Charge Transfer in Collisions of Li-3(+) And Be-4(+) Ions with Atomic Hydrogen at Low Impact Energy.
N82-11927/2 1152

ATOMIC SPECTROSCOPY
Advances in Sample Introduction for Elemental Analysis.
AD-A107 514/2 1150

Inductively Coupled Plasma-Atomic Emission Spectrometric Analysis of Environmental Samples Using Ultrasonic Nebulization.
PB82-118209 1229

Brain Destruction Alone Does Not Elevate Brain Aluminum.
PB82-133968 1132

ATOMIC STRUCTURE
Structure Study of Oxygen-Adsorbed Ni(111) Surface by High Energy Ion Scattering.
AD-A107 528/2 1150

ATOMIZERS
Improved Constant-Output Atomizer.
PAT-APPL-6-308 203 1225

Improved Atomization of Residual Fuels for Marine Boilers. Volume II: Cold Flow Baseline Performance Testing and Variation of Key Parameters - Cold Flow Improvement of Marine Boiler Atomizers,
PB82-132614 1202

ATOMS
Two-Photon Laser-Induced Fluorescence in Oxygen and Nitrogen Atoms.
AD-A107 017/6 1148

Post Hartree-Fock: Configuration Interaction.
LBL-8233 1151

ATS 5
ATS-5 12 Year in Orbit Evaluation.
N82-11101/4 1272

ATTITUDES
Attitudes Toward Cooperatives by Bank Trust and Professional Farm Managers,
PB82-131244 1080

Organizational Socialization: Predictors of Commitment during and After Entry.
PB82-137746 1110

Effect of Race on Opinions of Structure and Neighborhood Quality,
PB82-144825 1118

ATTRACTANTS
A New Approach for the Control of Cockroaches Utilizing the Entomophilic Nematode DD-136 in Conjunction with Attractants.
AD-A107 458/2 1136

AUDITING
Examination of the Effectiveness of Statutory Offices of Inspector General.
AD-A107 187/7 1089

Terminating the Audit of the National Flood Insurance Program's Fiscal 1980 Financial Statements.
AD-A107 188/5 1089

Status Report on Implementation of GAO's Audit Findings and Recommendations.
AD-A107 376/6 1090

AUGER ELECTRON SPECTROSCOPY
Electrostatic Binding of Electroactive and Non-Electroactive Anions in a Surface-Confined, Electroactive Polymer: Selectivity of Binding Measured by Auger Spectroscopy and Cyclic Voltammetry.
AD-A106 928/5 1148

AURORAE
Chatanika Radar Measurements during the Auroral E Program.
AD-A107 117/4 1083

AUSTENITIC STEELS
Influence of Irradiation on the Tensile Properties of Austenitic Stainless Steel Weldments.
DE81032002 1221

Swelling and Microstructure of HFIR Irradiated Austenitic Stainless Steels.
DE82000158 1192

AUTOMATIC CONTROL
Concept for a Power System Controller for Large Space Electrical Power Systems.
N82-11109/7 1177

Remote Automatic Weather Station for Resource and Fire Management Agencies.
PB82-107335 1087

Control of Building Engineering Services. Part 1: Background,
PB82-134669 1092

Control of Building Engineering Services. Part 2: A Survey of Proprietary Automation Systems,
PB82-134677 1092

Control of Building Engineering Services. Part 3: A Proposal for a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134685 1092

Control of Building Engineering Services. Part 4: Hardware Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134693 1092

Control of Building Engineering Services. Part 5: Software Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134701 1092

Control of Building Engineering Services. Part 6: Survey of the Control Systems Centre's Building Engineering Services,
PB82-134719 1092

Multivariable Pole Assignment Self Tuning Regulators,
PB82-135674 1199

AUTOMATIC INFLATION DEVICES
Development of Automatic Inflation Devices for Life Preservers.
AD-A107 107/5 1140

AUTOMATIC TRACKING
Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236

AUTOMATION
Machine Intelligence Research Applied to Industrial Automation.
PB82-133075 1222

AUTOMOBILE ENGINES
Jet Impingement Heat Transfer Enhancement for the GPU-3 Stirling Engine.
N82-11993/4 1271

AUTOMOBILE TIRES
Automobile Tires. April, 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859802 1222

AUTOMOBILES
Directory of Information for Dynamometer Testing of 1979-1981 Light Duty Motor Vehicles,
PB82-106873 1221

Windshield Damage and Driving Safety.
PB82-128653 1225

The Role of an Understanding of Social Factors in Forecasting Car Ownership,
PB82-135773 1221

Final Results of the 'One Week Follow-Up' with Participants during the FY79 and FY80 Emission Factor Testing Programs.
PB82-139494 1222

Taxicab Transportation. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802497 1217

AUTOMOTIVE COMPONENTS
Effects of Alcohol Fuels on Engine Wear.
AD-A107 136/4 1266

AUTOMOTIVE INDUSTRY
Profiles of Automotive Suppliers Industries-Engineered Mechanical Components and Systems: Volume I, Text.
PB82-129503 1098

Profiles of Automotive Suppliers Industries-Engineered Mechanical Components and Systems: Volume II, Appendices.
PB82-129511 1098

AUTOMOTIVE VEHICLES
Consumers Need More Reliable Automobile Fuel Economy Data.
AD-A106 833/7 1179

AUTOPILOT COMPUTER SYSTEM
AUTOPILOT: A Distributed Planner for Air Fleet Control.
AD-A107 139/8 1236

AUXILIARY POWER SOURCES
Irrigation Market for Solar Thermal Parabolic Dish Systems.
N82-11549/4 1182

AUXILIARY PROPULSION
Study of Electrical and Chemical Propulsion Systems for Auxiliary Propulsion of Large Space Systems. Volume 1: Executive Summary.
N82-11110/5 1271

Study of Electrical and Chemical Propulsion Systems for Auxiliary Propulsion of Large Space Systems, Volume 2.
N82-11111/3 1271

AVALANCHES
Design Criteria for Avalanche Control Structures in the Runout Zone.
PB82-108093 1169

AVIATION SAFETY
Aircraft Alerting Systems Standardization Study. Volume I. Candidate System Validation and Time-Critical Display Evaluation.
AD-A107 225/5 1079

First Annual Workshop on Aviation Related Electricity Hazards Associated with Atmospheric Phenomena and Aircraft Generated Inputs, February 26-27, 1980,
AD-A107 326/1 1077

AVIONICS
Mathematics Curricula Requirements and Performance Levels in Navy Class 'C' Electronics Schools.
AD-A106 995/4 1106

Avionic Communications and Avionic Navigation Systems Specialties AFS 328X0 and 328X1.
AD-A107 115/8 1107

AWARDS
The Oil Shale Corporation Loan Guarantee Contract.
AD-A106 887/3 1180

Determination of Contract Suitability to the Award Fee Concept.
AD-A107 465/7 1090

An Evaluation of the National Heart, Lung and Blood Institute's Pulmonary Academic Award Program.
PB82-141326 1135

AWAY-FROM-REACTOR STORAGE
Licensing Schedule for Away-from-Reactor (AFR) Spent Fuel Storage Facilities.
DE82000408 1244

AXES (REFERENCE LINES)
Focal Axis Resolver for Offset Reflector Antennas.
PAT-APPL-6-308 009 1179

AXIAL FLOW COMPRESSOR BLADES
Multistage Axial Compressor Program on Tip Clearance Effects.
AD-A107 445/9 1270

AXIALLY SYMMETRIC FLOW
A Method of Determining the Turbulent Base Pressure in Uniform and Non-Uniform Supersonic Axisymmetric Flows.
AD-A107 318/8 1076

AZIDES
Impact of Energy-Related Pollutants on Chromosome Structure. Progress Report, January 1, 1981-December 31, 1981.
DE82000153 1121

AZOLES
Chemistry of Aryloxazolines. Applications to the Synthesis of Lignan Lactone Derivatives.
AD-A107 224/8 1147

AZULENES
The Nature of the Phase Transition Observed for Monolayers of Azulene on Pt(III).
AD-A107 067/1 1148

Chemisorption and Thermal Chemistry of Azulene and Naphthalene Adsorbed on Pt(III).
AD-A107 068/9 1148

BACKACHE
Prevention of Low Back Injury in the Industrial Work Force: Symposium Held at Cincinnati, Ohio on November 9, 1972,
PB82-107251 1140

BACKSCATTERING
Covariance Functions and Related Statistical Properties of Acoustic Backscattering from a Randomly Rough Air-Water Interface.
AD-A107 169/5 1252

BACTERIA
Biochemistry of Bacterial Forespore Development and Spore Germination.
AD-A107 012/7 1141

Bread and Bakery Products: Microbiology. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859711 1138

BACTERIAL AEROSOLS
Field Experiments with Artificial Aerosols at San Nicolas Island, California.
AD-A107 270/1 1084

BACTERIAL FORESPORE
Biochemistry of Bacterial Forespore Development and Spore Germination.
AD-A107 012/7 1141

BACTERIAL TOXINS
Reversal of Cholera Toxin-Induced Secretion in Rat Ileum by Luminal Berberine.
AD-A107 204/0 1144

BAKERY PRODUCTS
Bread and Bakery Products: Microbiology. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859711 1138

KEYWORD INDEX

BALLISTIC MISSILES
Study of Meteorological Conditions Along Actual or Proposed Reentry Trajectories.
AD-A107 035/8 1273

BALLOONING INSTABILITY
Resistive G-Modes and Ballooning.
LA-UR-80-738 1261

BALLOONS
The Air-Launched Balloon System (ALBS) Phase II Design Improvement and Test Program.
AD-A107 214/9 1077

Some Unique Applications for Tethered Balloon Systems.
AD-A107 292/5 1077

BANDPASS FILTERS
Tuned Analog Network.
PAT-APPL-6-301 077 1179

BANDWIDTH
Measurement of Optical Fiber Bandwidth in the Frequency Domain.
PB82-135179 1256

BANKING
The Comptroller of the Currency Should Decide the Extent to Which His Action Control System is Needed.
AD-A107 162/8 1097

BARLEY
Evaluation of Spring Wheat and Barley Crop Calender Models for the 1979 Crop Year.
N81-29508/1 1081

BARRIERS
Recent Geologic History of a Barrier Island.
AD-A107 497/0 1157

BARYONS
Hadron Production in Quark Combination with Colors.
JINR-R-2-12154 1258

BASE PRESSURE
A Method of Determining the Turbulent Base Pressure in Uniform and Non-Uniform Supersonic Axisymmetric Flows.
AD-A107 318/8 1076

BATTERY SEPARATORS
Battery Separators Based on Polyphenylquinoxaline Polymer Blends.
AD-A107 130/7 1195

Pore Size, Zinc Penetration, and Zinc Diffusion Studies on PPQ/CA Separators.
AD-A107 354/3 1187

BAYES THEOREM
The Multicategory Case of the Sequential Bayesian Pixel Selection and Estimation Procedure.
N81-29498/5 1198

BEACH EROSION
Mitigation of Shore Damage Attributed to the Federal Navigation Structures at Ludington Harbor, Michigan.
AD-A106 932/7 1203

BEAUFORT SEA
Airborne gamma-Ray Spectrometer and Magnetometer Survey: Harrison Bay Quadrangle, Alaska. Final Report, Volume 1.
DE82000338 1161

BEETLES
Monoterpenes of Lodgepole Pine Phloem as Related to Mountain Pine Beetles.
PB82-107293 1081

New Record of Introduced Hosts for the Mountain Pine Beetle in California.
PB82-134438 1082

Field Evaluation of Phloem-Mobile Acephate for Suppression of Southern Pine Beetle.
PB82-134479 1082

BEHAVIOR
Computer-Based Operant Behavioral System for Microwave Bioeffects Research.
AD-A107 021/8 1143

Microwave Irradiation and Instrumental Behavior in Rats: Unitized Irradiation and Behavioral Evaluation Facility.
AD-A107 023/4 1143

Informant Accuracy in Social Network Data V: An Experimental Attempt to Predict Actual Communication from Recall Data.
PB82-131210 1112

Behavioral Pharmacology of Human Drug Dependence.
PB82-136961 1141

BENEFICIARIES
Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume IV: Beneficiary Survey.
PB82-136185 1133

BENEFIT COST ANALYSIS
Railroad Yard Simulation Model: Description and Computer Program Users' Manual.
PB82-136886 1222

BENEFITS
Injury Compensation Process Delays Prompt Payment of Benefits to Federal Workers.
AD-A106 873/3 1088

Medicare's Reimbursement Policies for Durable Medical Equipment Should be Modified and Made More Consistent.
AD-A106 876/6 1122

BENZENE
Atmospheric Benzene Depletion by Soil Microorganisms.
PB82-126293 1170

BENZODIAZEPINES
Benzodiazepines: A Review of Research Results, 1980.
PB82-139106 1142

BERBERINE
Antisecretory Effects of Berberine in Rat Ileum.
AD-A106 953/3 1141

BERYLLIUM
Charge Transfer in Collisions of Li-3(+) And Be-4(+) Ions with Atomic Hydrogen at Low Impact Energy.
N82-11927/2 1152

Microcreep of Instrument Grade Beryllium.
PB82-137415 1193

BERYLLIUM 10
A Review and Interpretation of Recent Cosmic Ray Beryllium Isotope Measurements.
N82-12020/5 1083

BERYLLIUM IONS
Electron-Impact-Ionization Cross Sections and Rates for Highly Ionized Berylliumlike Ions.
PB82-137332 1153

BEVALAC
Relativistic Heavy-Ion Experiments.
DE81030544 1257

BEVERAGE INDUSTRY
A Study of Metric Conversion of Distilled Spirits Containers: A Policy and Planning Evaluation: Task I. Comprehensive Report on the Conversion Process,
PB82-134396 1099

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AD-A107 291/7 1232

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AD-A107 306/3 1255

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HRP-0903306/9 1124

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N82-11053/7 1078

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N82-11981/9 1095

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PB82-132846 1096

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Fog Prediction. 1964-November, 1981 (Citations from the NTIS Data Base).
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PB82-802596 1222

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PB82-859232 1168

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PB82-859240 1193

Dust Control in Pulp/Paper Mills. 1972-1981 (Citations from the Institute of Paper Chemistry Data Base).
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Analysis of Solid Surfaces. June, 1976-1981 (Citations from the Energy Data Base).
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Dust Control in Pulp/Paper Mills. 1976-1981 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
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Spark Chambers. 1976-1981 (Citations from the Energy Data Base).
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Electrodeposition of Nickel Base Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
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BIFURCATION THEORY

Two New Bifurcation Phenomena.
AD-A107 011/9 1196

BIFURCATIONS

Bifurcations and Multistability in Two-photon Processes.
PB82-133901 1152

BIG RIVER RESERVOIR

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AD-A107 148/9 1205

BILE

Effects of Intravenous 16,16 Dimethyl Prostaglandin E2 on Bile Salt Induced Injury to Gastric Mucosa in Canine Heidenhain Pouches.
AD-A106 950/9 1141

BILE DUCTS

Orthoplasty for Bile Duct Stricture at the Liver Hilum, A Preliminary Report of 5 Cases,
PB82-129727 1131

BINARY SYSTEMS

Prediction of the Critical Line of a Binary Mixture: Evaluation of the Interaction Parameters,
PB82-140583 1154

BINDING

Universal Binding Energy Relations in Metallic Adhesion.
N82-11183/2 1189

BIOASSAY

Identification or Development of Chemical Analysis Methods for Plants and Animal Tissues.
AD-A107 346/9 1144

Review of Short-Term Screening Tests for Mutagens, Toxigens, and Carcinogens.
ANL/BIM-79-1 1144

Use of Aquatic Oligochaete, 'Lumbriculus variegatus', for Effluent Biomonitoring.
PB82-137621 1136

BIOLOGICAL INDUSTRIAL WASTE TREATMENT

Treatability Studies of Pesticide Manufacturing Wastewaters: Ethylenebisdithiocarbamate Fungicides,
PB82-107566 1210

BIOLOGICAL INSECT CONTROL

A New Approach for the Control of Cockroaches Utilizing the Entomophilic Nematode DD-136 in Conjunction with Attractants.
AD-A107 458/2 1136

BIOLOGICAL WEED CONTROL

Proceedings, 15th Annual Meeting, Aquatic Plant Control Research Planning and Operations Review, held 17-20 November 1980, Savannah, Georgia.
AD-A107 083/8 1155

BIOLOGY

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BIOMASS

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BIOMASS CONVERSION

Overview of Considerations in Assessing the Biomass Potential of Army Installations.
AD-A107 132/3 1266

BIOMASS CONVERSION PLANTS

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DE81029028 1266

BIOMEDICAL RESEARCH

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BIOPHYSICS

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BIOSYNTHESIS

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DE82000396 1120

BIRDS

Marine Bird Populations of the Strait of Juan de Fuca, Strait of Georgia and Adjacent Waters in 1978 and 1979,
PB82-132622 1155

Distribution and Abundance of Marine Birds and Mammals Wintering in the Kodiak Area of Alaska.
PB82-140187 1155

BIRTH CONTROL

Third Evaluation of the Thailand National Family Planning Program.
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BIRTH DEFECTS

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BISMUTH SULFATES

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DE81030236 1267

BISTATIC RADAR

Bistatic Scattering Reflection Asymmetry, Polarization Reversal Asymmetry, and Polarization Reversal Reflection Symmetry.
AD-A107 065/5 1238

BITUMINOUS COAL

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BLACK HOLES

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BLACK SHALES

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DE82000388 1157

Procedures for Petrophysical, Mineralogical and Geochemical Characterization of Fine-Grained Clastic Rocks and Sediments.
METC/CR-79/26 1158

BLACK TAILINGS DAM
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AD-A107 504/3 1208

BLADE TIPS
Multistage Axial Compressor Program on Tip Clearance Effects.
AD-A107 445/9 1270

BLAST WAVES
Shock Tube Tests of Muzzle Blast Transducers.
AD-A107 319/6 1251

Model of Direct Initiation of Unconfined Detonations.
AD-A107 446/7 1251

BLATTIDAE
A New Approach for the Control of Cockroaches Utilizing the Entomophilic Nematode DD-136 in Conjunction with Attractants.
AD-A107 458/2 1136

BLENDING
Battery Separators Based on Polyphenylquinoxaline Polymer Blends.
AD-A107 130/7 1195

Miscible Polymer Blends Based on Polycarbonate and a Copolyester.
AD-A107 389/9 1195

BLIND BROOK COUNTRY CLUB DAM
National Dam Safety Program. Blind Brook Country Club Dam (Inventory Number N.Y. 123), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 419/4 1208

BLOCK COPOLYMERS
Estimation of the Homogenization Temperature of a 1.2 Polybutadiene/1.4 Polybutadiene Diblock Copolymer Using Rheological Testing Methods.
AD-A107 069/7 1194

BLOOD BANKS
Optimal Control of a Network of Whole Blood Banks: Target Inventory Levels for a Hospital Blood Bank or a Decentralized Regional Blood Banking System.
PB82-106816 1130

BLOOD PRESSURE
Effects of Curative Treatment Emphasizing Endurance Training on the Performance and Blood Pressure of Hypertensive and Normotensives.
N82-11771/4 1144

BLUFF BODIES
A Wake Source Model for Non-Symmetric Flow past Bluff Bodies in Two-Dimensional Flow.
N82-11037/0 1076

BODIES OF REVOLUTION
Generation of Axi-Symmetric Body Shapes in Subsonic Flow by Means of Polynomial Distributions of Sources and Doublets Along the Axis of Symmetry.
N82-11038/8 1254

BOEING 747 AIRCRAFT
SEL and EPNL Noise Duration Coefficients for the 747 and T-38 Aircraft.
N82-11860/5 1078

BOILER TUBES
Design Model for the Heat Transfer in a Short Straight Tube Boiler.
AD-A107 454/1 1200

BOILERS
Improved Atomization of Residual Fuels for Marine Boilers. Volume II: Cold Flow Baseline Performance Testing and Variation of Key Parameters - Cold Flow Improvement of Marine Boiler Atomizers,
PB82-132614 1202

BOILING
Boiling Heat Transfer in Confined Space.
AD-A107 363/4 1200

BOLTED JOINTS
Analysis of Continuous Beams with Joint Slip.
AD-A107 112/5 1221

BONDING
Ultra-Lightweight Mirror Manufacturing and Radiation Response Study.
AD-A106 998/8 1222

BONE MARROW
Myeloproliferative Disorder with Unusual Marrow Chromosome Constitution.
AD-A107 206/5 1123

BONES
Evaluation of the Parietal Bones in the Rat as a Specific Site for the Testing of Osteogenic Materials. A Simple Animal Model to Study Bone Implant Material.
AD-A107 036/6 1123

BOOKS
Terrorism; A Bibliography of Books and Periodical Articles.
AD-A107 291/7 1232

BORANES
Pentamethylcyclopentadienyl Cobaltaboranes Derived from the B5H8(-) and B9H14(-) Ions: Studies in Synthesis and Structure.
AD-A107 457/4 1147

BOREHOLES
Marine Seismic System At-Sea-Test Deployment Operation. Revision.
AD-A106 991/3 1168

BORON
Model for the Elongation of Boron on Tungsten during Chemical Vapor Deposition.
AD-A106 989/7 1191

Anisotropic Elastic Constants of a Fiber-Reinforced Boron-Aluminum Composite.
PB82-134016 1191

BORON 11
Hyperfragment Production in Proton-Nucleus Interactions at 70 and 250 GeV.
JINR-R-1-12315 1258

BORON HYDRIDES
Pentamethylcyclopentadienyl Cobaltaboranes Derived from the B5H8(-) and B9H14(-) Ions: Studies in Synthesis and Structure.
AD-A107 457/4 1147

BOSONS
Correlations of Identical Particles in the "Resonance + Particle" System.
JINR-R-2-12302 1258

BOSTON (MASSACHUSETTS)
Can Community Economic Development Meet the Fiscal Needs of Municipalities. Economic Growth and Fiscal Stress in Three Northeast Cities,
PB82-144510 1101

BOUND STATE
Upper Limits for the Number of Bound States Associated with the Yukawa Potential,
PB82-140625 1261

BOUNDARY LAYER
A Computer Analysis of the Plasma-Boundary Layer Behavior over a Positive Electrode.
AD-A107 455/8 1260

BOUNDARY LAYER CONTROL
New Estimation Method for Flutter or Divergence Boundary from Random Responses at Subcritical Speeds.
N82-11034/7 1077

Amplified Crossflow Disturbances in the Laminar Boundary Layer on Swept Wings with Suction.
N82-11391/1 1078

BOUNDARY LAYER EQUATIONS
A Second-Order Accurate Procedure for Solving the Boundary Layer Equations Based on the Predictor-Corrector Form of the Crank-Nicolson Scheme.
N82-11826/6 1198

BOUNDARY LAYER SEPARATION
A Summary of V/STOL Inlet Analysis Methods.
N82-11043/8 1077

BOUNDARY LAYERS
Aircraft Wing Trailing-Edge Noise.
N82-11039/6 1076

BOUNDARY VALUE PROBLEMS
A Second-Order Accurate Procedure for Solving the Boundary Layer Equations Based on the Predictor-Corrector Form of the Crank-Nicolson Scheme.
N82-11826/6 1198

BRAKES (FOR ARRESTING MOTION)
Standard Specification for Air-Brake Reservoirs.
N82-11464/6 1220

BRAKES (MOTION ARRESTERS)
Railroad Yard Simulation Model: Description and Computer Program Users' Manual.
PB82-138686 1222

BRAYTON CYCLE POWER SYSTEMS
Executive Summary: Brayton Isotope Power System.
DE81027473 1249

BREAD
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BREAKWATERS
Some Observations on the Economics of 'Overdesigning' Rubble-Mound Structures with Concrete Armor.
AD-A107 240/4 1205

Linearized Solution to Inlet Equation with Inertia. Stability of Rubble Mound Breakwaters. Particle Motion under Stokes Waves.
AD-A107 343/6 1156

BREEDER REACTORS
Update of Cost Information Contained in a Previous GAO Report on Specific Aspects of the Clinch River Breeder Reactor Project.
AD-A106 918/6 1246

BREEDING BLANKETS
Tokamak Blanket Design Study, Final Report.
ORNL/TM-7049 1240

BRIDGE DECKS
Polymer Impregnated Concrete and Polymer Concrete Overlays. Volume I.
PB82-133661 1220

BRIGHTNESS TEMPERATURE
Antenna Pattern Modification for Single Reflector Antennas.
N82-11336/2 1264

SMMR Data Set Development for GARP.
N82-11512/2 1085

BRINES
Chemistry of Silica in Cerro Prieto Brines.
LBL-10166(Rev.) 1158

Nuclear Materials Research Progress Reports for 1979.
LBL-11030 1249

BRITTLENESS
Brittle Materials Design, High Temperature Gas Turbine.
AD-A107 522/5 1189

BROKERAGE INDUSTRY
Initial Public Offerings of Common Stock: The Role of Regional Broker-Dealers in the Capital Formation Process: Phase I Report.
PB82-135997 1099

The Role of Regional Broker-Dealers in the Capital Formation Process: Underwriting, Market-Making and Securities Research Activities: Phase II Report.
PB82-136003 1099

BROMATES
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DE81030542 1150

BUDGETS
Elimination of Federal Funds for the Heber Project will Impede Full Development and Use of Hydrothermal Resources.
AD-A106 916/0 1180

BUILDING CODES
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PB82-134081 1226

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BUILDINGS
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LA-7689-M(Ver.2.1)(Pt.1) 1181

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ORNL/Sub-7470/1-V3 1183

Control of Building Engineering Services. Part 1: Background,
PB82-134669 1092

Control of Building Engineering Services. Part 2: A Survey of Proprietary Automation Systems,
PB82-134677 1092

Control of Building Engineering Services. Part 3: A Proposal for a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134685 1092

Control of Building Engineering Services. Part 4: Hardware Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134693 1092

Control of Building Engineering Services. Part 5: Software Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134701 1092

Control of Building Engineering Services. Part 6: Survey of the Control Systems Centre's Building Engineering Services,
PB82-134719 1092

Single-Room Heat Balance for Building Heat Transfer,
PB82-135609 1226

Documentation of Program for Determination of Conduction Transfer Functions,
PB82-136284 1226

A 'Uniformity Principle' for Evacuation Route Allocation,
PB82-140633 1199

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PB82-144437 1227

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PB82-146341 1227

BURNING RATE
Burning Rate Maximum of a Plane Premixed Flame.
AD-A107 163/8 1264

KEYWORD INDEX

BURNS (INJURIES)
US Army Institute of Surgical Research Annual Research Progress Report, FY 1980.
AD-A107 093/7 1123

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BURTON-DUENKE NUMBER 5 DAM
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BUSCH WILDLIFE AREA NUMBER 35 DAM
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BWR TYPE REACTORS
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Seminar on Countermeasures for Pipe Cracking in BWRs.
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BYRAM LAKE RESERVOIR DAM
National Dam Safety Program. Byram Lake Reservoir Dam (Inventory Number N.Y. 1175), Long Island Basin, Westchester County, New York. Phase I Inspection Report.
AD-A107 417/8 1207

C-X WEAPON SYSTEM
Questionable Use of the C-X and Other Air Force Weapon System Funds.
AD-A106 896/0 1231

CABLE TELEVISION
The States Regulate Cable: A Legislative Analysis of Substantive Provisions,
PB82-128984 1234

Taxation, Regionalization and Pole Attachments: A Comparison of State Cable Television Policies,
PB82-128992 1234

The Regulation of Cable Television Subscriber Rates by State Commissions,
PB82-129008 1234

The Economic Impact of State Cable TV Regulation,
PB82-129016 1235

Federal Preemption of State Regulation in Cable Television,
PB82-129024 1235

Chronology of Cable Television Regulation: 1947 - 1978,
PB82-129032 1235

Executive Summary of Findings of the State Cable Television Regulation Project,
PB82-129040 1235

CADETS
Characteristics of the Class of 1985,
AD-A107 100/0 1107

CAI (COMPUTER AIDED INSTRUCTION)
Utilization of Tactical Computers for Training: Field Evaluation Plan.
AD-A107 316/2 1108

Utilization of Tactical Computers for Training: Analysis of System and Training Requirements.
AD-A107 531/6 1109

CALCIUM
The Effects of Diet Calcium, Protein and Acidity on Calcium Retention in the Rat, Particularly as Related to the Inner and Outer Surfaces of Tubular Bone: A Possible Model for the Treatment or Prevention of Osteoporosis.
AD-A107 200/8 1123

CALCIUM ISOTOPES
Mound Facility Activities in Chemical and Physical Research: July-December 1979.
MLM-2727 1240

CALCIUM PHOSPHATES
Aqueous Dissolution of Calcium Metaphosphate Glasses.
DE81030130 1189

CALCIUM PLAGES
Evolutionary Charts of Solar Activity (Calcium Plages) as Functions of Heliographic Longitude and Time 1964-1979,
PB82-130774 1083

CALIBRATING
Low-Cost Solar Array Project: Four Absolute Cavity Radiometer (Pyrheliometer) Intercomparisons at New River, Arizona: Radiometer Standards.
N82-11435/6 1228

CALIFORNIA
Terminal Forecast Reference Notebook, Fresno Air Terminal, California.
AD-A107 434/3 1086

Use of Fuel Oil by Stationary Sources in California.
PB82-124405 1183

CALIFORNIUM 252
Shape of Prompt Neutron Spectrum from exp 252 Cf Spontaneous Fission.
NIIAR-1(360) 1260

CALORIMETERS
The Graphite Calorimeter as a Standard of Absorbed Dose for Cobalt-60 Gamma Radiation,
PB82-140617 1241

CAMAC SYSTEM
MBD Diagnostics.
LA-8435-MS 1173

CAMS
An Integrated Approach to the Optimization of High-Speed Cam-Follower Systems.
AD-A107 387/3 1224

CANADA
Hydrogeological and Geochemical Studies in the Perch Lake Basin. A Second Report of Progress.
AECL-6404 1157

The Role of Communications and Information Resources in Canada,
PB82-129057 1235

CANCER
Fathering and the Pediatric Cancer Experience.
AD-A106 945/9 1122

Selected Aspects of Cancer-Related Proteins, Carbohydrate, Lipid, and Other Biochemistry.
PB81-929905 1120

The United States-Japan Cooperative Cancer Research Program Progress Report, April 1980 through March 1981.
PB82-120635 1131

CANOPIES (VEGETATION)
Soil Moisture Inferences from Thermal Infrared Measurements of Vegetation Temperatures.
N81-29500/8 1169

CAPACITY (QUANTITY)
Potential Impediment of Foundry Capacity Relative to National Defense Needs.
AD-A106 885/7 1097

CAPILLARY CHROMATOGRAPHY
Capillary Chromatography of Foods. July, 1973-December, 1981 (Citations from the Food Science and Technology Abstracts Data Base).
PB82-858341 1138

CAPILLARY FLOW
Diffusion of Gases in Capillaries.
DE82000267 1253

CAPITAL
Initial Public Offerings of Common Stock: The Role of Regional Broker-Dealers in the Capital Formation Process: Phase I Report.
PB82-135997 1099

The Role of Regional Broker-Dealers in the Capital Formation Process: Underwriting, Market-Making and Securities Research Activities: Phase II Report.
PB82-136003 1099

CAPTURED AIR BUBBLE SHIPS
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PB82-802844 1224

Surface Effect Vehicles/Ships in Marine Environments. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802851 1224

CARBAZONES
2-Acetylpyridine Thiosemicarbazones. 3. Selenium Analogs as Potential Antimalarial Agents.
AD-A106 958/2 1141

CARBINOLS
Effects of Alcohol Fuels on Engine Wear.
AD-A107 136/4 1266

CARBOHYDRATE METABOLISM
Effects of Exercise Training on Lipid and Carbohydrate Metabolism in Hemodialysis Patients.
PB82-137860 1134

CARBOHYDRATES
Selected Aspects of Cancer-Related Proteins, Carbohydrate, Lipid, and Other Biochemistry.
PB81-929905 1120

Biotechnology in Agricultural Research (Biotechnologie in het Landbouwkundig Onderzoek).
PB82-140450 1134

CARBON 12
Hyperfragment Production in Proton-Nucleus Interactions at 70 and 250 GeV.
JINR-R-1-12315 1258

CARBON 12 TARGET
Polarization Transfer in Inelastic Scattering.
LA-UR-80-2427 1259

CARBON COMPOUNDS
Laser-Induced-Fluorescence Studies of Fragment Ions: CH Exp + and CD exp + .
DE82001010 1151

CARBON DIOXIDE
The Carbonate System in the Western Mediterranean Sea.
AD-A107 390/7 1168

Carbon Dioxide Absorption Characteristics of High Performance Sodasorb at 1 Atmosphere.
AD-A107 488/9 1140

CARBON DIOXIDE LASERS
Fiber-Coupled External-Cavity Semiconductor High-Power Laser.
AD-A107 227/1 1255

Operational Characteristics of 16 mu M CO sub 2 Laser. Final Technical Report, 1 February 1977-30 September 1980.
ALO-4199-1 1255

CARBONATES
The Carbonate System in the Western Mediterranean Sea.
AD-A107 390/7 1168

CARBORANES
Polycarboranes. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802554 1195

CARBURETORS
Evaluation of the Micro-Carburetor.
N82-11994/2 1271

CARDIAC PACEMAKERS
Cardiac Pacemakers. 1976-1981 (Citations from the Energy Data Base).
PB82-859950 1141

CAREER LADDERS
Airborne Communication Systems Career Ladder, AFSC 294X0.
AD-A107 472/3 1109

Fuels Career Ladder AFSC 631X0.
AD-A107 473/1 1109

CAREERS
Effect of Work Schedule, and Description of Career Intention on Organizational Effectiveness.
AD-A106 819/6 1105

Air War College Class of 1981 Retention Survey.
AD-A107 103/4 1107

Airborne Communication Systems Career Ladder, AFSC 294X0.
AD-A107 472/3 1109

Fuels Career Ladder AFSC 631X0.
AD-A107 473/1 1109

CARGO SHIPS
Ship Chartering Alternatives for Grain-Exporting Cooperatives.
PB82-130881 1098

CARGO TRANSPORTATION
Coal Transportation: An Analysis of Cost and Energy Requirements (Sicherheitsaspekte einer Kuenftigen Europaeischen Wasserstoff-Technologie).
PB82-140104 1167

CARRIER LANDINGS
Conceptual Development of a Preliminary LSO Carrier Landing Training Aid.
AD-A107 002/8 1107

CASCADE FLOW
Calculations of Transonic Potential Flow over Cascades.
N82-11041/2 1270

CASH FLOW
Farm Sector Application of Flow-of-Funds Accounting.
PB82-137738 1093

CATALOGS (PUBLICATIONS)
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PB82-138140 1153

CATALYSIS
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PB82-859505 1269

CATALYSTS
Development of Catalytic Systems for the Conversion of Syngas to Jet Fuel and Diesel Fuel and Higher Alcohols. Annual Report.
DE82000067 1151

Using Diffusion Measurements to Determine Pore-Size Distributions in Porous Materials.
LA-UR-80-635(Rev.) 1151

Assessment of Advanced Coal Gasification Processes.
N82-11146/9 1147

CATALYTIC COMBUSTORS
Catalytic Combustion with Incompletely Vaporized Residual Fuel.
DE82000419 1265

CAVITATION
Proceedings of the Thirteenth Symposium on Naval Hydrodynamics Held at Tokyo (Japan) on October 6-10 1980,
AD-A106 987/1 1224

CAVITIES
Effects of Gas-Flow Pattern on Cavity Shape.
DE82000347 1161

CDC COMPUTERS
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LBL-10189/1 1174

CENTRAL AMERICA
Radar Mapping, Archaeology, and Ancient Land Use in the Maya Lowlands.
N82-11514/8 1104

CENTRAL PROCESSING UNITS
Concept for a Power System Controller for Large Space Electrical Power Systems.
N82-11109/7 1177

CENTRAL TENDENCY
Five Robust Indicators of Central Value,
PB82-133109 1198

CENTRIFUGAL PUMPS
Liquid Oxygen Turbopump Technology.
N82-11468/7 1225

CERAMIC MATERIALS
Brittle Materials Design, High Temperature Gas Turbine.
AD-A107 522/5 1189

CERAMICS
Fossil Energy Program. Quarterly Progress Report for the Period Ending June 30, 1981.
DE82000505 1268

Survey of Matrix Materials for Solidified Radioactive High-Level Waste.
DE82000708 1244

Durability of Simulated Supercalcine Ceramics at Geologic Storage Conditions.
NUREG/CR-2418 1245

CEREALS
Grain Fumigation: A Multifaceted Issue Needing Coordinated Attention.
AD-A106 841/0 1079

CEREBRAL CORTEX
Long and Short-Term Memory Processes in Cortically Damaged Patients.
AD-A107 258/6 1123

CEREBRUM
Cerebral Economics: Resource Competition within but not Between Hemispheres.
AD-A107 362/6 1112

CERRO PRIETO GEOTHERMAL FIELD
Intersecting Faults and Sandstone Stratigraphy at the Cerro Prieto Geothermal Field.
LBL-9546 1158

Chemistry of Silica in Cerro Prieto Brines.
LBL-10166(Rev.) 1158

Subsurface Geological and Geophysical Study of the Cerro Prieto Geothermal Field.
LBL-10540 1158

CERTIFICATE OF NEED
Economic Impact and Project Selection Methodology for Certificate of Need.
HRP-0903735/9 1129

CESIUM 137
In-Situ High-Resolution gamma-Spectrometric Survey of Burial Ground-Monitoring Wells.
DE81030827 1245

CHARACTERISTICS
Synthesis of Recent Research on Medical Career Decisions: A Comparative Study of Physicians from Two Decades. Executive Summary and Final Report.
PB82-133737 1110

CHARGE CARRIERS
Spatial Separation of Carriers in InAs-GaSb Superlattices.
AD-A107 155/4 1263

Impact Ionization and Hot Carrier Transport in Semiconductors.
AD-A107 386/5 1263

CHARGE EXCHANGE
Charge Transfer in Collisions of Li-3(+) And Be-4(+) Ions with Atomic Hydrogen at Low Impact Energy.
N82-11927/2 1152

CHARGE-EXCHANGE REACTIONS
A Study of the (26)Mg((12)C,(12)B)(26)Al Charge Exchange Reaction,
PB82-135740 1260

CHARGED PARTICLES
Charged Particle Simulation of Fast Neutron Damage.
AD-A107 394/9 1245

CHARS
Investigation of Factors Affecting the in-Situ Combustion Retorting of Oil Shale. Final Report.
DE82000482 1161

Erosion-Corrosion-Wear Program.
LBL-11109 1192

CHECKOUT PROCEDURES
Weapon Characteristics.
AD-A107 310/5 1251

CHEMICAL ANALYSIS
Fractionation of Diesel Fuel from Petroleum and Paraho Shale Oils.
AD-A107 042/4 1266

Characterization of Pollutants at Holston Army Ammunition Plant,
AD-A107 340/2 1149

Identification or Development of Chemical Analysis Methods for Plants and Animal Tissues.
AD-A107 346/9 1144

Neutron-Capture gamma-Ray Analysis of Coal for Sulfur, Iron, Silicon and Moisture.
IS-T-847 1165

Aluminum Particle Surface Studies in Al/Cu sub 2 O by Electron Spectroscopy for Chemical Analysis and Auger Electron Spectroscopy.
MLM-2664 1250

The Direct Determination, by Differential Pulse Anodic-Stripping Voltammetry at the Thin Mercury-Film Electrode, of Cadmium, Lead, and Copper,
PB82-133125 1152

Determination of Polychlorinated Biphenyls in Waste and Lubricating Oils.
PB82-133950 1153

Differential Pulse Detection in Liquid Chromatography and Its Application to the Measurement of Organometal Cations.
PB82-133976 1153

Standard Reference Materials: Summary of the Clinical Laboratory Standards Issued by the National Bureau of Standards.
PB82-135161 1153

Modification of a Commercial Atomic Absorption Spectrophotometer for Cold-Vapor Determination of Mercury.
PB82-135716 1229

The Certification of Polycyclic Aromatic Hydrocarbon Materials (PAH). Part II: The Six Methylchrysene Isomers (BRC Reference Materials No. 77, 78, 79, 80, 81 and 82),
PB82-138355 1153

Chemical Analysis of Aerosols and Airborne Particulates. 1977-June, 1980 (Citations from the NTIS Data Base).
PB82-802422 1154

Chemical Analysis of Aerosols and Airborne Particulates. July, 1980-November, 1981 (Citations from the NTIS Data Base).
PB82-802430 1154

CHEMICAL BONDS
Electrostatic Binding of Electroactive and Non-Electroactive Anions in a Surface-Confined, Electroactive Polymer: Selectivity of Binding Measured by Auger Spectroscopy and Cyclic Voltammetry.
AD-A106 928/5 1148

CHEMICAL COMPOSITION
Applications of the Microscan 9 Microanalyser.
AD-A106 969/9 1148

CHEMICAL EFFLUENTS
Review of Short-Term Screening Tests for Mutagens, Toxigens, and Carcinogens.
ANL/BIM-79-1 1144

CHEMICAL EXPLOSIONS
Response of Containment Vessels to Explosive Blast Loading.
LA-8082 1250

CHEMICAL EXPLOSIVES
Response of Containment Vessels to Explosive Blast Loading.
LA-8082 1250

Tool Force Evaluation of Lathe Machined High Explosives.
MHSMP-80-20 1250

Perfluorocarbon Vapor Tagging of Blasting Cap Detonators.
PATENT-4 256 038 1250

CHEMICAL INDUSTRY
Application of the Method of Inequalities to the Multivariable Control of Binary Distillation Columns,
PB82-134792 1147

Waste Processing and Pollution in the Chemical and Petrochemical Industries. 1978-June, 1980 (Citations from the NTIS Data Base).
PB82-802661 1147

Waste Processing and Pollution in the Chemical and Petrochemical Industries. July, 1980-November, 1981 (Citations from the NTIS Data Base).
PB82-802679 1147

CHEMICAL LASERS
Device Development Program for Efficient Excitation of a Blue-Green Laser.
AD-A107 073/9 1255

Laser-Stimulated Molecular Dynamics and Rate Processes.
AD-A107 246/1 1149

Research on Metal Halide Laser Systems.
AD-A107 398/0 1255

CHEMICAL PROPULSION
Study of Electrical and Chemical Propulsion Systems for Auxiliary Propulsion of Large Space Systems. Volume 1: Executive Summary.
N82-11110/5 1271

Study of Electrical and Chemical Propulsion Systems for Auxiliary Propulsion of Large Space Systems, Volume 2.
N82-11111/3 1271

CHEMICAL REACTION KINETICS
NRCC Software Catalog. Volume 1.
LBL-10811 1174

CHEMISORPTION
Chemisorption and Thermal Chemistry of Azulene and Naphthalene Adsorbed on Pt(III).
AD-A107 068/9 1148

CHEMOTHERAPEUTIC AGENTS
Preferential Inhibition of Ribonucleic Acid Synthesis by a New Thiosemicarbazone Possessing Antibacterial and Antiparasitic Properties.
AD-A106 951/7 1141

Determination of N-Methyl Pyridinium-2-Aldoxime Chloride and Its Hydrolytic By-Products by Ion-Pair High-Performance Liquid Chromatography.
AD-A106 962/4 1141

International Symposium on Nuclear Techniques in the Study and Control of Parasitic Diseases of Man and Animals.
AD-A107 302/2 1123

CHF-1 INSECT REPELLENT
Primary Dermal Irritation Potential of the Insect Repellent CHF1 and Its Components.
AD-A106 944/2 1144

CHIASMAL REGION
A New Concept on Chiasmal Architecture and Its Projection on the Retina,
PB82-136060 1133

CHILDREN
Follow-Up Review to Determine the Extent to Which the Department of Health and Human Services has Implemented the Recommendations in Our Report: 'Increased Federal Efforts Needed to Better Identify, Treat, and Prevent Child Abuse and Neglect'.
AD-A106 849/3 1113

As Parents Go, So Go the Children. The Development and Adjustment of Children in the Military.
AD-A107 347/7 1112

CHLORATES
Research in Nuclear Chemistry. Progress Report, March 1, 1981-February 28, 1982.
DE81030542 1150

CHLORIDES
Apparent Molal Volumes and Adiabatic Compressibilities of Aqueous Transition Metal Chlorides at 25 c.
AD-A107 222/2 1149

CHLORINATION
Coal Desulfurization by Low Temperature Chlorinolysis, Phase 3.
N82-11145/1 1209

CHLORINE
Review of Open Literature on Effects of Chlorine on Aquatic Organisms.
DE82000097 1145

Studies of Free Radicals by Ultraviolet Excimer Laser Photolysis. Progress Report, 1 April 1981-1 October 1981.
DE82000688 1151

Acclimation Temperature: An Important Factor Influencing the Interaction of Chlorine, delta T and Exposure Duration to Eggs, Prolarvae and Larvae of Striped Bass, 'Morone saxatilis',
PB82-118894 1145

CHLORINE COMPOUNDS
Evaluation of Gamma Radiation for Destruction of Pentachlorophenol in Aqueous Solution and on Activated Carbon.
AD-A106 943/4 1154

Competitive Pathways in Chlorine Dioxide Oxidation of Amines: Amide Formation from Acyclic Amines.
AD-A107 242/0 1147

CHLOROMETHANES
Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
PB82-107210 1139

CHLOROPHYLLS
Development of the Coastal Zone Color Scanner for Nimbus 7. Volume 1: Mission Objectives and Instrument Description.
N82-11511/4 1228

CHOCKS
Alert Aircraft Roll Over Chocks.
AD-A107 456/6 1079

CHOLERA
Reversal of Cholera Toxin-Induced Secretion in Rat Ileum by Luminal Berberine.
AD-A107 204/0 1144

CHOLINESTERASE INHIBITORS
Determination of N-Methyl Pyridinium-2-Aldoxime Chloride and Its Hydrolytic By-Products by Ion-Pair High-Performance Liquid Chromatography.
AD-A106 962/4 1141

CHROMIUM
Electroplating of Chromium. 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859786 1223

Electroplating of Chromium. 1970-1981 (Citations from the NTIS Data Base).
PB82-859794 1223

CHROMIUM ALLOYS
Erosion-Corrosion-Wear Program.
LBL-11109 1192

CHROMIUM-MOLYBDENUM STEELS
Fossil Energy Program. Quarterly Progress Report for the Period Ending June 30, 1981.
DE82000505 1268

Fossil Energy Materials Needs Assessment.
ORNL/TM-7232 1193

CHROMOSOMES
Myeloproliferative Disorder with Unusual Marrow Chromosome Constitution.
AD-A107 206/5 1123

Radiation and Biophysical Studies on Cells and Viruses. Progress Report, September 1, 1979-June 15, 1980.
ORO-2832-213 1143

Baseline Study of Effects of Ionizing Radiation on the Chromosomes of the Marine Worm, 'Neanthes arenaceodentata'.
PB82-131517 1143

CHROMOSPHERE
Theoretical Studies of Chromospheres and Winds in Cool Stars.
N82-12004/9 1082

CIGARETTE SMOKING
Smoking and Health, A Report of the Surgeon General.
PB82-141300 1135

CIRCADIAN RHYTHMS
When the Grand Tour's a Grind,
AD-A106 618/8 1143

CIRCUITS
MOS Circuits. 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859471 1179

MOS Circuits. 1970-1981 (Citations from the NTIS Data Base).
PB82-859489 1179

CIRCULAR CYLINDERS
Surface-Tension Induced Instabilities: Effects of Lateral Boundaries.
N82-11390/3 1262

CIRCULAR ERROR PROBABLE
Study of Meteorological Conditions Along Actual or Proposed Reentry Trajectories.
AD-A107 035/8 1273

CITIZEN PARTICIPATION
Consumer Representation in Standards Development: Literature Review and Issue Identification.
PB82-135880 1093

CLASSIFICATION
FERC Should Improve the Natural Gas Well Determination Process.
AD-A106 859/2 1265

CLASSIFICATIONS
Development of Advanced Acreage Estimation Methods.
N81-29495/1 1156

Evaluation of Multiband, Multitemporal, and Transformed Landsat Mss Data for Land Cover Area Estimation.
N81-29496/9 1080

Nationwide Forestry Applications Program. Analysis of Forest Classification Accuracy.
N81-29499/3 1081

Maximum Likelihood Clustering with Dependent Feature Trees.
N81-29502/4 1198

New Output Improvements for Classy.
N81-29503/2 1080

Users Manual for the US Baseline Corn and Soybean Segment Classification Procedure.
N81-29504/0 1080

Estimation of Proportions in Mixed Pixels Through Their Region Characterization.
N81-29510/7 1198

Evaluation of Large Area Crop Estimation Techniques Using Landsat and Ground-Derived Data.
N81-29511/5 1081

CLAVULANIC ACID
Initial Results of In Vitro Studies of Clavulanic Acid Synergism,
PB82-129735 1141

CLEAN AIR ACT AMENDMENTS OF 1977
Permit Fee Guideline.
PB82-107871 1210

CLINCH RIVER BREEDER REACTOR
Blowdown Transients and Implication for Leak Protection Shutdown Strategy.
DE81027453 1247

CLINICAL MEDICINE
Standard Reference Materials: Summary of the Clinical Laboratory Standards Issued by the National Bureau of Standards.
PB82-135161 1153

CLOSURES
Technical and Economic Evaluation of Mine Closure Procedures.
PB82-136995 1167

CLOUD COVER
Improved Simulation of Aerosol, Cloud, and Density Measurements by Shuttle Lidar.
N82-11688/0 1085

Time-Variable Earth's Albedo Model Characteristics and Applications to Satellite Sampling Errors.
N82-11723/5 1085

Computation of Averaged Monthly Zonal Albedo Utilizing the Solar Zenith Angle, Properties of Clear and Cloudy Atmospheres.
N82-12010/6 1082

CLOUD SEEDING
Continuing Design Work for the Sierra Cooperative Pilot Project: Interim Report No. 4,
PB82-136607 1087

CLOUDS
Theoretical Investigation of Absorptive Processes.
AD-A107 278/4 1253

CLOUDS (METEOROLOGY)
Observations of the Modification of Cloud Condensation Nuclei in Wave Clouds.
PB82-132564 1087

CLUMPS
New Output Improvements for Classy.
N81-29503/2 1080

CLUSTERING
Rank Correlation Coefficients as Optimality Measures for Ordinal Cluster Methods.
AD-A107 109/1 1196

A Model for Ordinal Nonhierarchical Cluster Methods.
AD-A107 111/7 1196

CO-GENERATION
Cogeneration Feasibility Study in the Gulf States Utilities Service Area.
ORNL/SUB-7317/1 1187

Cogeneration Institutional Study in the Geismar, LA, and Orange, Texas Areas.
ORNL/SUB-7317/2 1187

Assessment of an Atmospheric Fluidized-Bed Coal-Combustion Gas-Turbine Cogeneration System for Industrial Application.
ORNL/TM-6626/V1 1187

COAL
Coal and Nuclear Wastes--Both Potential Contributors to Environmental and Health Problems.
AD-A106 884/0 1135

Final Report on Grant No. DE-FG21-78ET13383.
DE81029479 1264

Project to Develop and Demonstrate Methods to Eliminate Frozen-Coal-Handling Problems. Status Report IV.
DE81030967 1161

Rate Guide for Residential No. 2 Heating Oil and Coal for SOLCOST Data Bank Cities.
DE82000483 1268

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DE82000505 1268

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DOE/ET/15167-191 1265

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IS-T-847 1165

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LA-UR-80-551 1165

Statistical Validity for Electron Probe Microanalysis of Organic Sulfur in Coal.
LA-UR-80-585 1228

Combustion Research. Chapter from the Energy and Environment Division Annual Report 1978.
LBL-9809 1209

Coal Desulfurization by Low Temperature Chlorinolysis, Phase 3.
N82-11145/1 1209

Geologic Considerations in Underground Coal Mining System Design.
N82-11516/3 1166

Summary of the Research and Development Effort on Open-Cycle Coal-Fired Gas Turbines.
ORNL/TM-6253 1270

Assessment of an Atmospheric Fluidized-Bed Coal-Combustion Gas-Turbine Cogeneration System for Industrial Application.
ORNL/TM-6626/V1 1187

State Flows of Energy in 1975.
ORNL/TM-6977 1183

ORNL Coal Chemistry Report, 1979. Executive Summary.
ORNL-5629 1138

The Cooperative Coal Marketing Arrangement in Eastern Kentucky: A Feasibility Report.
PB82-107327 1098

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PB82-140104 1167

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PB82-141359 1216

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PB82-858820 1167

COAL DEPOSITS
Proceedings of the Second Annual Methane Recovery from Coal Beds Symposium.
METC/SP-79/9 1166

COAL FIRED POWER PLANTS
Scavenging of Aerosol Particles by Precipitation.
PB82-134404 1213

COAL GASIFICATION
Fuel Gas Demonstration Plant Program: Small-Scale Industrial Project. Demonstration Plant Design Manual, Phase I.
COO-5066-T12(V.1) 1145

Fuel Gas Demonstration Plant Program: Small-Scale Industrial Project. Demonstration Plant Design Manual, Phase I.
COO-5066-T12(V.2) 1145

Fixed-Bed Gasification.
DE82000432 1146

Fossil Energy Program. Quarterly Progress Report for the Period Ending June 30, 1981.
DE82000505 1268

Assessment of Advanced Coal Gasification Processes.
N82-11146/9 1147

ORNL Coal Chemistry Report, 1979. Executive Summary.
ORNL-5629 1138

On-Site GC/MS Analysis of Chapman Gasification Separator Liquor.
PB82-107285 1152

COAL GASIFICATION PLANTS
Fuel Gas Demonstration Plant Program: Small-Scale Industrial Project. Demonstration Plant Design Manual, Phase I.
COO-5066-T12(V.1) 1145

Fuel Gas Demonstration Plant Program: Small-Scale Industrial Project. Demonstration Plant Design Manual, Phase I.
COO-5066-T12(V.2) 1145

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IITRI-M-6043-6(QTPR) 1268

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MIT-2295T9-15 1182

Summary of the Research and Development Effort on Open-Cycle Coal-Fired Gas Turbines.
ORNL/TM-6253 1270

Fossil Energy Materials Needs Assessment.
ORNL/TM-7232 1193

COAL HANDLING
Implications of Power Plant Coal Conversions on the Ports of New England: Volume I.
PB82-136409 1231

Implications of Power Plant Coal Conversions on the Ports of New England. Volume II: Appendices,
PB82-136417 1231

COAL LIQUEFACTION
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DE81030379 1267

ORNL Coal Chemistry Report, 1979. Executive Summary.
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COAL LIQUEFACTION PLANTS
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DE81031937 1145

Fossil Energy Program. Quarterly Progress Report for the Period Ending June 30, 1981.
DE82000505 1268

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DOE/ET/10069-T1(V.2) 1146

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DOE/ET/10069-T1(V.3) 1146

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MIT-2295T9-15 1182

Fossil Energy Materials Needs Assessment.
ORNL/TM-7232 1193

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DOE/ET/10069-T7(V.1) 1146

COAL MINES
Comments on Interior's Surface Mining Regulations.
AD-A107 185/1 1161

Evaluation of the Seismic System for Locating Trapped Miners.
PB82-138660 1167

COAL MINING
Coal Cooperative Efficiency Program: Small Mine Operations.
PB82-109901 1166

COAL PREPARATION
Magnetic Separation of Materials. June, 1976-1981 (Citations from the Energy Data Base).
PB82-859083 1223

COAL SEAMS
Proceedings of the Second Annual Methane Recovery from Coal Beds Symposium.
METC/SP-79/9 1166

COAL UTILIZATION
Lewis Research Center's Coal-Fired, Pressurized, Fluidized-Bed Reactor Test Facility.
N82-11397/8 1265

COANDA NOISE SUPPRESSORS
Design and Fabrication of Coanda Suppressor Flow Visualization Model,
AD-A107 436/8 1270

COAST GUARD
Information on the U.S. Coast Guard's Decision to Purchase the M/V Cowslip Vessel.
AD-A107 374/1 1231

COASTAL REGIONS
Aerosol Composition in the Marine and Coastal Boundary Layer.
AD-A107 308/9 1084

COASTAL ZONE COLOR SCANNER
Development of the Coastal Zone Color Scanner for Nimbus 7. Volume 1: Mission Objectives and Instrument Description.
N82-11511/4 1228

COASTS
Saco and Southern Maine Coastal River Basins Overview.
PB82-107517 1210

Water Resources Data for Louisiana, Water Year 1980. Volume 3: Coastal Louisiana.
PB82-129305 1160

Wave Forces on Causeway-Type Coastal Bridges: Effects of Angle of Wave Incidence and Cross-Section Shape.
PB82-131657 1211

COATED FUEL PARTICLES
Dissolution of HTGR TRISO Beads by the Alkali Fluoride Fusion Method.
NBL-296 1249

COATINGS
Sputtered Films for Wavelength-Selective Applications.
AD-A107 232/1 1200

COBALT
Application of a Rare-Earth Cobalt Magnet to Synchronous Motors.
N82-11358/0 1171

High Temperature Sulfidation of Cobalt and Cobalt Alloys. 1970-1981 (Citations from the NTIS Data Base).
PB82-858580 1193

Flotation Separation of Cobalt and Titanium Particles. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859398 1194

COBALT 60
In-Situ High-Resolution gamma-Spectrometric Survey of Burial Ground-Monitoring Wells.
DE81030827 1245

The Graphite Calorimeter as a Standard of Absorbed Dose for Cobalt-60 Gamma Radiation,
PB82-140617 1241

COBALT ALLOYS
High Temperature Sulfidation of Cobalt and Cobalt Alloys. 1970-1981 (Citations from the NTIS Data Base).
PB82-858580 1193

Electrodeposition of Cobalt Base Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859919 1223

COBALT COMPOUNDS
Pentamethylcyclopentadienyl Cobaltaboranes Derived from the B5H8(-) and B9H14(-) Ions: Studies in Synthesis and Structure.
AD-A107 457/4 1147

COBOL
COBOL Analysis and Translate System (CATS).
PB82-121773 1174

COBOL Analysis and Translate System (CATS). Technical Note.
PB82-121781 1175

COBOL Structured Code Analyzer.
PB82-121880 1175

COBOL Audit and Debugging Aid (CADA INSERT).
PB82-121930 1175

COBOL Audit and Debugging Aid (CADA INSERT). Technical Note.
PB82-121948 1175

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PB82-134412 1175

COCAINE
Cocaine: Metabolism, Toxicity, and Behavioral Effects. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859315 1142

COCKPITS
The Impact of New Guidance and Control Systems on Military Aircraft Cockpit Design.
AD-A107 356/8 1079

CODASYL PROGRAMMING LANGUAGES
Evaluation Criteria for a CODASYL Query Language.
PB82-136748 1176

Capabilities for a CODASYL Query Language.
PB82-136755 1176

A Survey of CODASYL Query Languages.
PB82-136763 1176

CODING
Codes for Named Populated Places, Primary County Divisions, and Other Locational Entities of the United States (Fourth Update); FIPS PUB-55.
PB82-135146 1176

COEFFICIENTS
Rank Correlation Coefficients as Optimality Measures for Ordinal Cluster Methods.
AD-A107 109/1 1196

Identification of Wheelset/Rail Creep Coefficients from Dynamic Response Data Using the Maximum Likelihood Parameter Identification Technique.
AD-A107 447/5 1221

COHERENCE
Interactions between Large-Scale Coherent Structures and Fine-Grained Turbulence in Free Shear Flows.
AD-A107 210/7 1253

Maximum Likelihood Estimation of Magnitude-Squared Coherence.
AD-A107 352/7 1197

COHERENT ACOUSTIC RADIATION
Optical Fiber Interferometer for the Study of Ultrasonic Waves in Composite Materials.
N82-11121/2 1191

COHESION
Universal Binding Energy Relations in Metallic Adhesion.
N82-11183/2 1189

COHESIVE SOILS
The Resilient and Plastic Characteristics of Michigan Subgrade Soils and Their Soil Support Values.
PB82-109570 1170

COLD FRONTS
Evaluation of Photogrammetric Flight under Icing Conditions on March 23, 1978.
N82-11725/0 1087

COLD REGIONS
Cold Regions Testing of an Air-Transportable Shelter,
AD-A107 131/5 1226

COLD WEATHER OPERATIONS
Mine/Countermine Problems During Winter Warfare.
AD-A107 047/3 1231

COLLISION AVOIDANCE
Simulator Evaluation of Electronic Radio Aids to Navigation Displays--The Miniexperiment.
AD-A107 072/1 1236

COLLISION BROADENING
Lifetime Broadening of Excited Pyrazine Adsorbed on Ag(111).
AD-A106 854/3 1148

COLLISIONS
Time-Resolved Infrared Study of Bimolecular Reactions between Tert-Butly Radicals.
AD-A107 154/7 1148

COLMONOY
Thermophysical Properties of Selected Wear-Resistant Alloys.
HEDL-TME-79-6 1192

COLONIC NEOPLASMS
Determination of Estrogen Receptor in Human Colon Cancer Tissue with Labeled Fluorescence Estradiol (Fluorescein Isothiocyanate),
PB82-129719 1131

COLOR MODEL
Hadron Production in Quark Combination with Colors.
JINR-R-2-12154 1258

COLOR PHOTOGRAPHY
Development of Advanced Acreage Estimation Methods.
N81-29495/1 1156

COLORADO
Nure Aerial gamma-Ray and Magnetic Reconnaissance Survey: Colorado-Arizona Area, Grand Canyon NJ 12-10 Quadrangle.
GJBX-35(80)(V.2) 1163

Medicaid Nursing Home Reimbursement in Colorado (Volume 7).
PB82-139924 1134

COLORADO RIVER
Colorado River Simulation System: An Executive Summary,
PB82-139387 1161

COLORED SMOKES
Evaluation of Replacement Red Smoke Dyes for 1-N Methylaminoanthraquinone.
AD-A107 286/7 1190

COLORS
Image Segmentation with Color and Texture,
AD-A107 479/8 1173

COLOSTRUM
Colostrum: Immunological Aspects. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859588 1135

COLUMNS (SUPPORTS)
A Simplified Approach to Creep Buckling and Creep Instability of Steel-Concrete Columns,
PB82-132945 1219

COMBAT READINESS
Aviation Materiel Combat Ready In-Country (AMCRIC).
AD-A107 451/7 1231

COMBAT VEHICLES
Active RF Seeker Analysis for Land Combat Seekers.
AD-A106 947/5 1238

COMBINED-CYCLE POWER PLANTS
Conceptual Design Study of Potential Early Commercial MHD Powerplant. Final Report of Task 2 Results.
DE81030882 1185

COMBUSTION
Investigation of Combustion Process Using Fiber Optics.
AD-A107 029/1 1264

Secondary Combustion in Gun Exhaust Flows.
AD-A107 312/1 1251

Modeling Solid-Fuel Ramjet Combustion Including Radiation Heat Transfer to the Fuel Surface.
AD-A107 441/8 1270

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LBL-9809 1209

Experimental Study of the Combustion of Low-Grade Calorific Material with the Aim of Assessing its Utility Value (Etude Experimentale de la Combustion Des Matieres a Faible Pouvoir Calorifique en Vue de Leur Valorisation).
PB82-139460 1269

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PB82-857533 1225

COMBUSTION CHAMBERS
Numerical Simulation of Reactive Flow in Internal Combustion Engines.
LA-UR-80-1633 1271

Trends in High Temperature Gas Turbine Materials.
N82-11182/4 1193

COMBUSTION PRODUCTS
Coal Combustion Waste Manual: Evaluating Impacts to Fish and Wildlife.
PB82-141359 1216

COMBUSTION STABILITY
An Investigation of Flame Stability in a Coaxial Dump Combustor.
AD-A107 256/0 1264

COMBUSTORS
An Investigation of Flame Stability in a Coaxial Dump Combustor.
AD-A107 256/0 1264

Assessment of Pulverized-Coal-Fired Combustor Performance. Third Quarterly Technical Progress Report, April 1, 1981-June 30, 1981.
DE81030860 1265

COMETARY ATMOSPHERES
Radiative Transfer in Cometary Dust Atmospheres: Critique of Recent Developments.
N82-12015/5 1083

COMMAND AND CONTROL SYSTEMS
Guidelines for Managing the Flow of Information in an Automated Battlefield Command and Control System.
AD-A107 297/4 1233

Guideline Development for Summarization of Tactical Data.
AD-A107 329/5 1234

On the Design of Simulations of Command and Control Processes.
AD-A107 423/6 1108

Some Guidelines for Effective Task Design in Command and Control Simulations.
AD-A107 424/4 1108

COMMERCE

SBA's 7(j) Management Assistance Program: Changes Needed to Improve Efficiency and Effectiveness.
AD-A106 839/4 1088

SBA's Progress in Implementing the Public Law 95-507 Subcontracting and Surety Bond Waiver Provisions has been Limited.
AD-A106 840/2 1088

Data on Small Business--Much is Collected but it Should be Integrated for Better Use.
AD-A106 851/9 1094

National Waterways Study Overview of the Transportation Industry.
AD-A107 366/7 1224

COMMERCIAL AIRCRAFT

Lightweight Diesel Engine Designs for Commuter Type Aircraft.
N82-11068/5 1271

COMMERCIAL AVIATION

Report of the President's Task Force on Aircraft Crew Complement,
AD-A106 889/9 1106

Symposium on Commercial Aviation Energy Conservation Strategies, April 2-3, 1981. Papers and Presentations.
AD-A107 106/7 1181

COMMERCIAL BUILDINGS

Economic Evaluation of the Annual Cycle Energy System (ACES). Final Report. Volume III, Appendices.
ORNL/Sub-7470/1-V3 1183

Energy Conservation: Buildings. 1977-October, 1981 (Citations from the NTIS Data Base).
PB82-802513 1203

COMMERCIAL FISHING

Alaska OCS Socioeconomic Studies Program: St. George Basin and North Aleutian Shelf Commercial Fishing Industry Analysis.
PB82-139817 1122

COMMINUTION

Multivariable Control of a Milling Circuit at East Driefontein Gold Mine,
PB82-128729 1166

COMMUNICATION AND RADIO SYSTEMS

Simulation and Development of a PCSFSK Demodulator.
AD-A107 055/6 1233

Airborne Communication Systems Career Ladder, AFSC 294X0.
AD-A107 472/3 1109

Approximation of Processes and Applications to Control and Communication Theory,
AD-A107 520/9 1197

COMMUNICATION EQUIPMENT

FAA's Communications Equipment Replacement Plans.
AD-A107 186/9 1233

TRACALS Evaluation Report. Communications Initial Evaluation Report, Hill AFB, Utah, 9-15 June 1981.
AD-A107 507/6 1237

COMMUNICATION NETWORKS

Design Methodology and Development History of an ISO OSI Layered Architecture for the Canadian Broadcast Telidon System.
N82-11337/4 1234

COMMUNICATIONS INTELLIGENCE

Private and Public Defenses Against Soviet Interception of U.S. Telecommunications: Problems and Policy Points,
PB82-129073 1235

COMMUNICATIONS MANAGEMENT

Compunications Network Management,
PB82-129081 1235

The Exchange Network Facilities for Interstate Access (ENFIA) Interim Settlement Agreement: Using Governmentally Sanctioned Negotiating Processes to Coordinate Telecommunications Facilities and Services,
PB82-129099 1235

COMMUNICATIONS NETWORKS

Analysis of Flow Behavior Within An Integrated Computer-Communication Network,
AD-A107 254/5 1233

The Worldwide Navigational Warning Service,
AD-A107 372/5 1234

A Distributed Algorithm for Minimum Weight Directed Spanning Trees.
AD-A107 462/4 1173

Computer Networks. August, 1979-November, 1981 (Citations from the NTIS Data Base).
PB82-802919 1177

COMMUNIST COUNTRIES

U.S. Laws and Regulations Applicable to Imports from Nonmarket Economies Could be Improved.
AD-A106 878/2 1097

COMMUNITIES

Final Report of the Research Institute for Community Economic Development, St. Louis, Missouri, June 1, 1978-September 14, 1979.
PB82-131590 1098

The Community Mental Health Project: Pilot Project.
PB82-135252 1132

COMMUNITY DEVELOPMENT

Alaska OCS Socioeconomic Studies Program: St. George Basin Petroleum Development Scenarios, Anchorage Impact Analysis.
PB82-139825 1216

Proposition 13 Research Inventory: A Partial Inventory of Research in the State of California and Elsewhere,
PB82-144429 1216

Can Community Economic Development Meet the Fiscal Needs of Municipalities. Economic Growth and Fiscal Stress in Three Northeast Cities,
PB82-144510 1101

COMMUNITY HEALTH SERVICES

The Health Systems Agency Role in Building Primary Care Systems at the Local Level: A Recent Example,
HRP-0903737/5 1129

Evaluation of a New Community Rape Treatment Center,
PB82-133398 1132

COMPARISON

Comparisons of Some Large Scientific Computers.
N82-11817/5 1174

COMPENSATION

Injury Compensation Process Delays Prompt Payment of Benefits to Federal Workers.
AD-A106 873/3 1088

Limits on Receipt of Multiple Disability Benefits Could Save Millions.
AD-A106 874/1 1106

Congress Should Increase Financial Protection to the Public from Accidents at DOE Nuclear Operations.
AD-A106 917/8 1242

Issues Related to the Longshoremen's and Harbor Workers' Compensation Act.
AD-A107 193/5 1108

COMPILERS

Project RMAG: SLANG (Structured Language) Compiler,
PB82-127267 1175

Harris Corporation, Harris 1600-02 Model II, Harris Interactive COBOL, Version 107.1 (Validation).
PB82-134412 1175

COMPONENT RELIABILITY

Standard Specification for Light Ladders.
N82-11277/2 1218

COMPOSITE MATERIALS

Study of Graphite/Epoxy Composites for Material Flaw Criticality.
AD-A107 391/5 1190

Environmental Failure of Adhesive Bonding in Composites.
AD-A107 538/1 1190

Novel Improved PMR Polyimides.
N82-11117/0 1190

Anisotropic Elastic Constants of a Fiber-Reinforced Boron-Aluminum Composite.
PB82-134016 1191

COMPOSITE PROPELLANTS

Ignition of Composite Propellants under Rapid Pressure Loading.
AD-A107 147/1 1271

COMPOSITE STRUCTURES

Icing Tunnel Tests of a Composite Porous Leading Edge for Use with a Liquid Anti-Ice System.
N82-11052/9 1078

COMPRESSIBLE FLOW

Numerical Simulation of a Compressible Homogeneous, Turbulent Shear Flow.
N82-11396/0 1254

COMPRESSING

Boosting Up of Neutral Beam Heating Power by Slowly Rising Toroidal Field.
N82-11929/8 1240

COMPRESSIVE PROPERTIES

The Volume and Compressibility Change for the Formation of Transition Metal Sulfate Ion Pairs at 25 C.
AD-A107 149/7 1148

Apparent Molal Volumes and Adiabatic Compressibilities of Aqueous Transition Metal Chlorides at 25 c.
AD-A107 222/2 1149

Adiabatic Partial Molal Compressibilities of Electrolytes in 0.725m NaCl Solutions at 25 c.
AD-A107 223/0 1149

COMPRESSOR EFFICIENCY

JT8D High Pressure Compressor Performance Improvement.
N82-11467/9 1270

COMPRESSORS

JT8D High Pressure Compressor Performance Improvement.
N82-11467/9 1270

COMPTROLLERS

The Comptroller of the Currency Should Decide the Extent to Which His Action Control System is Needed.
AD-A107 182/8 1097

COMPUTATION

Computation of Averaged Monthly Zonal Albedo Utilizing the Solar Zenith Angle, Properties of Clear and Cloudy Atmospheres.
N82-12010/6 1082

Interactive Maximum Likelihood Estimation,
PB82-134784 1198

Computation of Abscissa of Stability by Repeated Use of the Routh Test,
PB82-134800 1199

The Use of Computers in Solving Mathematical Problems. 1976-November, 1981 (Citations from the NTIS Data Base).
PB82-802398 1177

COMPUTATIONAL FLUID DYNAMICS

Computation of High Reynolds Number Internal/External Flows.
N82-11046/1 1254

Higher-Level Simulations of Turbulent Flows.
N82-11395/2 1254

A Computer Solution to the Stationary Navier-Stokes Equations in Two Dimensions with Proven Convergence.
N82-11398/6 1254

COMPUTATIONS

A Basic Computer Program to Calculate Moisture Content in Resins and Fibre Reinforced Resin Composites.
AD-A106 970/7 1194

Alternatives to the Current Method of Computing General Schedule Pay.
AD-A107 178/6 1107

COMPUTER AIDED DESIGN

Design Aids for VLSI: The Berkeley Perspective.
AD-A107 019/2 1178

The Dynamic Design-Analysis Method (DDAM) in NASTRAN.
AD-A107 074/7 1262

The Automatic Generation of Syntax Directed Editors.
AD-A107 078/8 1171

AUTOPILOT: A Distributed Planner for Air Fleet Control.
AD-A107 139/8 1236

Programming Support Library (PSL). Users Manual.
AD-A107 249/5 1172

Programming Support Library (PSL). Technical Report.
AD-A107 250/3 1172

Programming Support Library (PSL). Operations Manual.
AD-A107 251/1 1172

Programming Support Library (PSL). Maintenance Manual. Volume I.
AD-A107 252/9 1172

Programming Support Library (PSL). Maintenance Manual. Volume II.
AD-A107 253/7 1172

Design Model for the Heat Transfer in a Short Straight Tube Boiler.
AD-A107 454/1 1200

COMPUTER AIDED INSTRUCTION

Prototype Equipment Student Guide for ACE (Air Intercept Controller Prototype Training System).
AD-A106 999/6 1106

Ordinal Syllabus for Air Intercept Controller Prototype Training System.
AD-A107 000/2 1106

Training Improvements for the Tactical Aircrew Training System (TACTS): Project Summary Report.
AD-A107 003/6 1107

Application of Tactical Data Systems for Training. Volume IV. Development of Courseware and Analysis of Results for GED Math.
AD-A107 530/8 1109

COMPUTER APPLICATIONS

Maui Optical Tracking and Identification Facility Transition Program.
AD-A106 997/0 1273

NAVPAC SST Data Processing--Mathematical Description.
AD-A107 082/0 1171

Computer Image Generation: Advanced Visual/Sensor Simulation.
AD-A107 098/6 1172

Selective Inquiry System (SIS). Operation Manual and Users Manual.
AD-A107 300/6 1173

Utilization of Tactical Computers for Training: Field Evaluation Plan.
AD-A107 316/2 1108

Proceedings of the 2nd Interservice/Industry Training Equipment Conference Held in Salt Lake City, Utah, November 18 through November 20, 1980.
AD-A107 437/6 1109

Utilization of Tactical Computers for Training: Analysis of System and Training Requirements.
AD-A107 531/6 1109

Control of Building Engineering Services. Part 2: A Survey of Proprietary Automation Systems,
PB82-134677 1092

Control of Building Engineering Services. Part 3: A Proposal for a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134685 1092

Control of Building Engineering Services. Part 4: Hardware Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134693 1092

Control of Building Engineering Services. Part 5: Software Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134701 1092

The Use of Computers in Solving Mathematical Problems. 1976-November, 1981 (Citations from the NTIS Data Base).
PB82-802398 1177

COMPUTER CODES

Interactive Model to Assess Economics of Anaerobic Digestion on the Farm.
DE82000452 1267

MASEC Industrial Fuel-Wood Program.
DE82000461 1268

DOE-2 Reference Manual.
LA-7689-M(Ver.2.1)(Pt.1) 1181

CONCHAS: An Arbitary Lagrangian-Eulerian Computer Code for Multicomponent Chemically Reactive Fluid Flow at All Speeds.
LA-8129-MS 1253

Evaluation of Residential Building Energy-Performance Standards.
LBL-9816 1201

BKY Programming Systems Bulletin No. 1. Guidelines for Converting FTN4 Programs to FTN5 and the New FORTRAN-77 Standard. First Edition.
LBL-10189/1 1174

NRCC Software Catalog. Volume 1.
LBL-10811 1174

SHAFT79 User's Manual.
LBL-10861 1166

Economic Evaluation of the Annual Cycle Energy System (ACES). Final Report. Volume III, Appendices.
ORNL/Sub-7470/1-V3 1183

ORNL Direct Purchase Information System (DPIS) User's Manual.
ORNL/TM-6428 1090

COMPUTER COMMUNICATIONS

Analysis of Flow Behavior Within An Integrated Computer-Communication Network,
AD-A107 254/5 1233

A Distributed Algorithm for Minimum Weight Directed Spanning Trees.
AD-A107 462/4 1173

The Connection Machine (Computer Architecture for the New Wave).
AD-A107 463/2 1173

COMPUTER CONFERENCING

The Networkers Network: A Study of the Impact of a New Communications Medium on Sociometric Structure.
PB82-130386 1114

Standardization in Microcomputer/LSI Products Via Electronic Information Exchange: JEDEC/EIES Project.
PB82-134735 1176

COMPUTER DESIGN

Comparisons of Some Large Scientific Computers.
N82-11817/5 1174

COMPUTER GRAPHICS

Methods for Presentation and Display of Multivariate Data.
N82-11833/2 1198

Plotting Routines NOMEN and CLINE.
PB82-121872 1175

COMPUTER LOGIC

On the Expressive Power of Dynamic Logic. II,
AD-A107 430/1 1197

COMPUTER NETWORKS

The Networkers Network: A Study of the Impact of a New Communications Medium on Sociometric Structure.
PB82-130386 1114

Computer Networks. August, 1979-November, 1981 (Citations from the NTIS Data Base).
PB82-802919 1177

COMPUTER PERSONNEL

The Veterans Administration's Efforts to Consolidate Computer Programming Resources at a Single Location.
AD-A107 197/6 1108

COMPUTER PROGRAM DOCUMENTATION

Programming Support Library (PSL).
AD-A107 248/7 1172

Programming Support Library (PSL). Users Manual.
AD-A107 249/5 1172

Programming Support Library (PSL). Technical Report.
AD-A107 250/3 1172

Programming Support Library (PSL). Operations Manual.
AD-A107 251/1 1172

Programming Support Library (PSL). Maintenance Manual. Volume I.
AD-A107 252/9 1172

Programming Support Library (PSL). Maintenance Manual. Volume II.
AD-A107 253/7 1172

Selective Inquiry System/Timesharing Retrieval Subsystem.
AD-A107 299/0 1173

Automatic Input Data Generation for ADINA and NASTRAN Structural Computer Codes.
AD-A107 534/0 1262

COMPUTER PROGRAMMING

Software Technology Transfer and Export Control.
AD-A106 869/1 1097

The Automatic Generation of Syntax Directed Editors.
AD-A107 078/8 1171

'Pseudo', A Macro-Based High Level Language for the PDP-11.
AD-A107 168/7 1172

The Single and Multiple Vehicle Pickup and Delivery Problem: Exact and Heuristic Algorithms.
AD-A107 202/4 1199

Programming Support Library (PSL). Users Manual.
AD-A107 249/5 1172

Programming Support Library (PSL). Technical Report.
AD-A107 250/3 1172

Programming Support Library (PSL). Operations Manual.
AD-A107 251/1 1172

Programming Support Library (PSL). Maintenance Manual. Volume I.
AD-A107 252/9 1172

Programming Support Library (PSL). Maintenance Manual. Volume II.
AD-A107 253/7 1172

Deductive Synthesis of the Unification Algorithm,
AD-A107 328/7 1173

Proceedings of the ACM Symposium on Symbolic and Algebraic Computation (1981), Snowbird, Utah, 5-7 August 1981.
AD-A107 464/0 1197

The Impact of Multiprocessor Technology on High-Level Language Design.
AD-A107 533/2 1173

Thermal Algorithms Analysis.
N82-11800/1 1174

Patch Macro and Load Module (IRSPATCH).
PB82-121765 1174

COBOL Analysis and Translate System (CATS).
PB82-121773 1174

COBOL Analysis and Translate System (CATS). Technical Note.
PB82-121781 1175

COBOL Structured Code Analyzer.
PB82-121880 1175

COBOL Audit and Debugging Aid (CADA INSERT).
PB82-121930 1175

COBOL Audit and Debugging Aid (CADA INSERT). Technical Note.
PB82-121948 1175

Synopsis of Interviews from a Survey of Software Tool Usage.
PB82-133521 1175

POLO2: A User's Guide to Multiple Probit or LOgit Analysis.
PB82-134487 1198

Computer Science and Technology: A Survey of Software Tools Usage.
PB82-134743 1176

On-Lining an SDK-85 Microcomputer with a DEC System 10 for Down-Line Loading of Microcomputer Programs,
PB82-134776 1176

Design Concepts for a Hierarchical Two Dimensional Multiprocessor Structure,
PB82-135633 1176

The Use of Applicative Programming in Data Processing.
PB82-136219 1176

Test Problems and Results for OMNITAB 80.
PB82-136474 1176

Simulation of a Two-Dimensional Multiprocessor Structure,
PB82-136953 1177

Computer Metatheory for Sequencing and Database Management. 1972-1981 (Citations from the Engineering Index Data Base).
PB82-859372 1177

Computer Metatheory for Sequencing and Database Management. 1976-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-859380 1177

COMPUTER PROGRAMS

How to Make TIGER Perform: A Supplementary Operator's Manual for the TIGER Code.
AD-A106 822/0 1251

A Basic Computer Program to Calculate Moisture Content in Resins and Fibre Reinforced Resin Composites.
AD-A106 970/7 1194

A Program to Compute ELF/VLF Earth-Ionosphere Modal Height Gains via WKB Methods up to Satellite Altitudes.
AD-A107 517/5 1264

Nationwide Forestry Applications Program. Analysis of Forest Classification Accuracy.
N81-29499/3 1081

Conversion of Spu-Universal Disk File to Jsc-Universal Tape Storage: Convrt User's Guide.
N81-29501/6 1174

New Output Improvements for Classy.
N81-29503/2 1080

Descriptive and Sensitivity Analyses of Watbali: A Dynamic Soil Water Model.
N81-29507/3 1170

Some Observations on a New Numerical Method for Solving Navier-Stokes Equations.
N82-11032/1 1254

Computation of High Reynolds Number Internal/External Flows.
N82-11046/1 1254

Magnetic Field Satellite (MAGSAT) Data Processing System Specifications.
N82-11103/0 1174

Integrated Analysis of Engine.
N82-11491/9 1078

SPAR Data Set Contents.
N82-11816/7 1273

Digital Ultrasonics Signal Processing: Flaw Data Post Processing'Use and Description.
N82-11862/1 1228

COMPUTER SOFTWARE

INFO: The JHU/APL Information Package.
PB82-121740 1174

Patch Macro and Load Module (IRSPATCH).
PB82-121765 1174

COBOL Analysis and Translate System (CATS).
PB82-121773 1174

Methods and Standards System.
PB82-121799 1091

Methods and Standards System. Computer Operation Manual.
PB82-121807 1091

File Analysis and Selection Technique (FAST).
PB82-121815 1095

Label Utility System.
PB82-121831 1095

Label Utility System.
PB82-121849 1095

CLMTIC3 - Tally Incidence of Characters.
PB82-121856 1175

COPY3 - Copy Sequential Data Sets.
PB82-121864 1175

Plotting Routines NOMEN and CLINE.
PB82-121872 1175

COBOL Structured Code Analyzer.
PB82-121880 1175

DSMS Update System.
PB82-121898 1095

EEO System.
PB82-121914 1109

COBOL Audit and Debugging Aid (CADA INSERT).
PB82-121930 1175

COMPUTER SYSTEMS PROGRAMS

Traffic Diversion Software Applications Summary.
PB82-131673 1212

COMPUTERIZED DESIGN

Research in Nonlinear Structural and Solid Mechanics.
N82-11489/3 1262

COMPUTERIZED SIMULATION

How to Make TIGER Perform: A Supplementary Operator's Manual for the TIGER Code.
AD-A106 822/0 1251

Supply Workload Implications of Increased Deployment to the Indian Ocean.
AD-A106 994/7 1230

Simulation and Development of a PCSFSK Demodulator.
AD-A107 055/6 1233

Wartime Requirements for Ammunition Materiel and Personnel (WARRAMP). Volume I. Materiel Postprocessor User's Manual.
AD-A107 076/2 1232

A Method of Determining the Turbulent Base Pressure in Uniform and Non-Uniform Supersonic Axisymmetric Flows.
AD-A107 318/8 1076

Maximum Likelihood Estimation of Magnitude-Squared Coherence.
AD-A107 352/7 1197

On the Design of Simulations of Command and Control Processes.
AD-A107 423/6 1108

Some Guidelines for Effective Task Design in Command and Control Simulations.
AD-A107 424/4 1108

Modeling Solid-Fuel Ramjet Combustion Including Radiation Heat Transfer to the Fuel Surface.
AD-A107 441/8 1270

Electromagnetic Transmission through a Rectangular Aperture in a Perfectly Conducting Plane.
AD-A107 521/7 1264

Automatic Input Data Generation for ADINA and NASTRAN Structural Computer Codes.
AD-A107 534/0 1262

Improved Simulation of Aerosol, Cloud, and Density Measurements by Shuttle Lidar.
N82-11688/0 1085

Integrated Traffic Simulation Model - Phase I. Volume 1: Executive Summary.
PB82-139155 1215

Integrated Traffic Simulation Model - Phase I. Volume 2: Design of the TRAF Operating System (TDS).
PB82-139163 1215

Integrated Traffic Simulation Model - Phase I. Volume 3: TRAF Operating System Users Guide.
PB82-139171 1215

Integrated Traffic Simulation Model - Phase I. Volume 4: Revisions to UTCS-1 Traffic Simulation Model to Enhance Operational Effectiveness.
PB82-139189 1216

COMPUTERS

Software Technology Transfer and Export Control.
AD-A106 869/1 1097

A Statistical Methodology for Constructing Synthetic Test Workloads.
AD-A107 257/8 1172

ADPE Acquisition: The Acquisition of the Naval Postgraduate School Computer, A Case Study.
AD-A107 478/0 1090

Comparisons of Some Large Scientific Computers.
N82-11817/5 1174

CONCENTRATORS

Secondary and Compound Concentrators for Parabolic Dish Solar Thermal Power Systems.
N82-11550/2 1182

CONCRETE

Tensile Tests on Articulated Concrete Mattress Specimens.
AD-A107 422/8 1218

Evaluation of Tests for Determining the Pumpability of Concrete Mixtures.
AD-A107 524/1 1218

CONCRETE CONSTRUCTION

A Simplified Approach to Creep Buckling and Creep Instability of Steel-Concrete Columns,
PB82-132945 1219

Polymer Impregnated Concrete and Polymer Concrete Overlays. Volume I.
PB82-133661 1220

Design of Concrete Walls with Shear Failure (Diseno de Muros de Concreto Con Falla Por Cortante),
PB82-135385 1226

CONCRETE PATCHING

Polymer Concrete Patching. Volume II.
PB82-133679 1220

Polymer Concrete Patching. Volume III. User's Manual.
PB82-133687 1220

CONCRETE PAVEMENTS

improvement of Device (CMD) for Monitoring the Consolidation of Plastic Concrete.
PB82-132390 1219

Polymer Concrete Patching. Volume II.
PB82-133679 1220

Polymer Concrete Patching. Volume III. User's Manual.
PB82-133687 1220

Acceptance Sampling of Steel Reinforcing Bars.
PB82-135690 1220

Concrete (Rigid) Highway Pavements. 1974-November, 1981 (Citations from the NTIS Data Base).
PB82-802547 1217

CONCRETES

Stochastic Approach to Study the Influence of Rate of Loading on Strength of Concrete,
PB82-132135 1219

Concrete Mechanics. Part A. Theory and Experiments on the Mechanical Behaviour of Cracks in Plain and Reinforced Concrete Subjected to Shear Loading,
PB82-132705 1219

General Derivation of Hardening Formulas,
PB82-132937 1219

Mixing Water and Maturity of Hardened Concrete Using Scanning Electron Microscope Techniques. Part One,
PB82-133729 1220

Thermal Conductivity of a Concrete Mortar from 95 K to 320 K,
PB82-134370 1220

CONDENSATION NUCLEI

Observations of the Modification of Cloud Condensation Nuclei in Wave Clouds.
PB82-132564 1087

CONFERENCES

Workshop on Early Crustal Genesis: Implications from Earth.
N82-11691/4 1158

CONFERENCING (COMMUNICATIONS)

Atomic Physics 7.
AD-A107 089/5 1148

CONFIGURATION INTERACTION

Post Hartree-Fock: Configuration Interaction.
LBL-8233 1151

CONFIGURATIONS

A General Curvilinear Grid Generation Program for Projectile Configurations.
AD-A107 334/5 1250

CONFINED ENVIRONMENTS

Boiling Heat Transfer in Confined Space.
AD-A107 363/4 1200

CONFORMAL SOLUTION THEORY

Behavior of a Nonconformal Mixture via Computer Simulation.
PB82-137423 1153

CONGENITAL ABNORMALITIES

Fetal Alcohol Syndrome. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859943 1135

CONNECTICUT

Medicaid Nursing Home Reimbursement in Connecticut (Volume 6),
PB82-139916 1134

CONOWINGO DAM

Susquehanna River Anadromous Fish Studies, Conowingo Dam to Havre De Grace, Maryland.
PB82-135963 1121

CONRAIL

Conrail Needs to Further Improve Inventory Control and Management.
AD-A106 837/8 1088

CONSISTENCY

Improved Constant-Output Atomizer.
PAT-APPL-6-308 203 1225

CONSORTIA

Consortium for Public Administration Field Services: The First Two Years.
PB82-144700 1093

CONSTRUCTION

Eliminating Contractor Inspections of Federal Water Projects Could Save Millions.
AD-A106 838/6 1203

CONSTRUCTION INDUSTRY

The Information User in the Construction Industry - A Study of the Educational Need and Provision,
PB82-132648 1096

Productivity Trends in the Construction Industry: A Comparative International Review,
PB82-144320 1216

CONSUMER PROBLEMS

Consumers Need More Reliable Automobile Fuel Economy Data.
AD-A106 833/7 1179

CONTAINERLESS MELTS

Gas Levitator and Method for Containerless Processing.
PAT-APPL-6-297 486 1224

CONTAINERS

Determination of Sample Container Effects on Wearmetals Concentration in MIL-L-7808 Synthetic Lubricant Analyzed on an A/E35U-3 Fluid Analysis Spectrometer.
AD-A107 323/8 1194

A Study of Metric Conversion of Distilled Spirits Containers: A Policy and Planning Evaluation: Task I. Comprehensive Report on the Conversion Process,
PB82-134396 1099

CONTAINMENT SHELLS

Response of Containment Vessels to Explosive Blast Loading.
LA-8082 1250

CONTAMINANTS

Installation Restoration Program Records Search for Langley Air Force Base, Virginia.
AD-A106 864/2 1203

Laser Induced Fluoroescence from Algae: Results of a Ship-Borne Field Test.
N82-11758/1 1121

Marine and Estuarine Pollution.
PB82-128174 1136

CONTINENTAL SHELF

Bidding and Production Profiles for the Various Outer Continental Shelf Leasing Methodologies, 1954 to 1978.
LA-8497-MS 1182

CONTINENTAL SHELVES

A Summary of Environmental Geologic Studies on the Southeastern United States Atlantic Outer Continental Shelf, 1977-1978.
PB82-109273 1158

Alaska OCS Socioeconomic Studies Program: St. George Basin and North Aleutian Shelf Commercial Fishing Industry Analysis.
PB82-139817 1122

Distribution and Abundance of Marine Birds and Mammals Wintering in the Kodiak Area of Alaska.
PB82-140187 1155

CONTINUOUS WAVE LASERS

Fiber-Coupled External-Cavity Semiconductor High-Power Laser.
AD-A107 227/1 1255

Development of MBE Grown Pb-Salt Semiconductor Lasers for the 8.0 to 15.0 Micrometer Spectral Region.
N82-11453/9 1255

CONTINUUM MECHANICS

Research in Continuum Mechanics.
AD-A107 459/0 1262

CONTRACEPTIVES

Changing Patterns of Fertility: The Impact of Contraceptive Technology on a Maya Village.
PB82-131061 1131

CONTRACT ADMINISTRATION

Still No Progress in implementing Controls over Contracts and Grants with Indians.
AD-A106 830/3 1087

SBA's Progress in Implementing the Public Law 95-507 Subcontracting and Surety Bond Waiver Provisions has been Limited.
AD-A106 840/2 1088

Allegations of Unfair Bidding Requirements at Griffiss Air Force Base, Rome, New York.
AD-A106 893/1 1088

Inquiry Concerning Denial of Contracts to Low Offeror for Army Translation Services.
AD-A106 894/9 1088

An Examination of Year-End Spending with Regard to Department of Defense Contract Awards.
AD-A107 033/3 1089

Allegations of Unethical Bidding Practices on Federal Construction Contracts.
AD-A107 176/0 1089

The United States Synthetic Fuels Corporation's Project Selection Guidelines Need Clarification.
AD-A107 184/4 1266

Allocation of an Air Force Contractor's Pension Fund Assets May be Inequitable.
AD-A107 375/8 1090

Implementation of Subcontracting Provisions of Public Law 95-507 within Air Force Logistics Command and Air Force Systems Command.
AD-A107 450/9 1090

Determination of Contract Suitability to the Award Fee Concept.
AD-A107 465/7 1090

Military Contractor-Operated Stores' Contracts are Unmanageable and Vulnerable to Abuse.
AD-A107 499/6 1231

SBA's Progress in Implementing the Public Law 95-507 Subcontracting and Surety Bond Waiver Provisions Has Been Limited.
PB82-133844 1092

Let's Make a Deal or On the Way to Public - Private Partnerships,
PB82-144536 1093

CONTRACTS

Still No Progress in Implementing Controls over Contracts and Grants with Indians.
AD-A106 830/3 1087

Eliminating Contractor Inspections of Federal Water Projects Could Save Millions.
AD-A106 838/6 1203

The Oil Shale Corporation Loan Guarantee Contract.
AD-A106 887/3 1180

An Examination of Year-End Spending with Regard to Department of Defense Contract Awards.
AD-A107 033/3 1089

Allegations of Unethical Bidding Practices on Federal Construction Contracts.
AD-A107 176/0 1089

Allocation of an Air Force Contractor's Pension Fund Assets May be Inequitable.
AD-A107 375/8 1090

Implementation of Subcontracting Provisions of Public Law 95-507 within Air Force Logistics Command and Air Force Systems Command.
AD-A107 450/9 1090

Military Contractor-Operated Stores' Contracts are Unmanageable and Vulnerable to Abuse.
AD-A107 499/6 1231

Department of Transportation Awards to Academic Institutions in Fiscal Year 1980,
PB82-141508 1216

CONTROL

Proceedings, 15th Annual Meeting, Aquatic Plant Control Research Planning and Operations Review, held 17-20 November 1980, Savannah, Georgia.
AD-A107 083/8 1155

The Effects of Lateral Aerodynamic Uncertainties on the Handling Qualities of the Space Shuttle Orbiter at Mach Numbers of 1.5 and .6.
N82-11051/1 1272

Parameter Estimation of Large Flexible Aerospace Structures with Application to the Control of the Maypole Deployable Reflector.
N82-11099/0 1272

CONTROL BOARDS
Control Panels - Layout and Design,
PB82-132051 1222

CONTROL SYSTEMS
Vertical Axis Wind Turbine Control Strategy.
DE81031932 1181

CONTROL THEORY
Annual Progress Report.
AD-A106 983/0 1196

Digital Command Augmentation for Lateral-Directional Aircraft Dynamics.
AD-A107 264/4 1079

An Exact Penalty Function Algorithm for Optimal Control Problems with Control and Terminal Equality Constraints. Part 1.
AD-A107 275/0 1197

Approximation of Processes and Applications to Control and Communication Theory,
AD-A107 520/9 1197

Recursive System Identification Using Fast Algorithms,
PB82-134578 1198

Optimization of Stochastic Relay Control Systems by Means of Dimensional Analysis,
PB82-134610 1198

New Formulations for the Method of Inequalities,
PB82-135625 1199

Multivariable Pole Assignment Self Tuning Regulators,
PB82-135674 1199

On the Behaviour of Dynamical Systems Subject to Bounded Disturbances,
PB82-135682 1199

Control Theory. August, 1978-July, 1980 (Citations from the NTIS Data Base).
PB82-802448 1199

Control Theory. August, 1980-November, 1981 (Citations from the NTIS Data Base).
PB82-802455 1199

CONTROLLERS
Multivariable Pole Assignment Self Tuning Regulators,
PB82-135674 1199

Direct Current Motor Control. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-859562 1178

CONVECTION (HEAT TRANSFER)
Boiling Heat Transfer in Confined Space.
AD-A107 363/4 1200

CONVENIENCE FOODS
Convenience Foods: Quality and Packaging. 1972-1981 (Citations from the Food Science and Technology Abstracts Data Base).
PB82-858333 1138

CONVERGENCE
A Computer Solution to the Stationary Navier-Stokes Equations in Two Dimensions with Proven Convergence.
N82-11398/6 1254

COOKING DEVICES
Evaluation of Low-Cost Extrusion Cooker in Sri Lanka.
PB82-133786 1137

Application of Intermittent Ignition Devices to Commercial Cooking Equipment.
PB82-141078 1138

Commercial Cooking Equipment Improvement.
PB82-141094 1138

COOLERS
Radiative Cooler.
PAT-APPL-6-284 289 1201

COOLING
Theoretical Studies of Chromospheres and Winds in Cool Stars.
N82-12004/9 1082

COOLING AND VENTILATING EQUIPMENT
Energy-Efficient and Cost-Effective Equipment Should be Installed in New Government Housing.
AD-A106 900/4 1199

COOLING SYSTEMS
Evaluation of Residential Building Energy-Performance Standards.
LBL-9816 1201

Cooling by Conversion of Para to Ortho-Hydrogen.
PAT-APPL-6-301 075 1152

The Water Spray Cooler - An Update.
PB82-135724 1167

COOPERATION
State-Local Policy Management Project.
PB82-125907 1091

COOPERATIVES
Coal Cooperative Efficiency Program: Small Mine Operations.
PB82-109901 1166

Ship Chartering Alternatives for Grain-Exporting Cooperatives.
PB82-130881 1098

Financial Profile of 15 New Agricultural Marketing Cooperatives,
PB82-131202 1080

Attitudes Toward Cooperatives by Bank Trust and Professional Farm Managers,
PB82-131244 1080

Cooperative Farm Machinery Operations: Oregon and Wisconsin,
PB82-134123 1080

Vacation Farm Cooperatives,
PB82-134388 1080

COORDINATE TRANSFORMATIONS
Boundary-Fitted Coordinate Transformation for Thermo-hydraulic Analysis in Arbitrary Three-Dimensional Geometries,
NUREG/CR-2313 1197

COPOLYMERS
Synthesis, Radiation Degradation, and Electron Beam Resist Behavior of Fluorine-Containing Vinyl Polymers.
AD-A106 913/7 1194

COPPER
Survey of Matrix Materials for Solidified Radioactive High-Level Waste.
DE82000708 1244

Flotation Separation of Copper Particles. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859364 1194

Electroplating of Copper. 1976-1981 (Citations from the Engineering Index Data Base).
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Electroplating of Copper. 1970-1981 (Citations from the NTIS Data Base).
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COPPER ALLOYS
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PB82-859075 1223

COPPER OXIDE SOLAR CELLS
Investigation of Solar Cells Base on Cu sub 2 O. Final Progress Report, June 1, 1980-May 31, 1981.
DE81030274 1185

CORES
New Molding Method of Three-Dimensional Hollow Photoelastic Model and Centrifugal Stress Analysis of Air Cooled Turbine Blade Model.
N82-11067/7 1270

CORN
Users Manual for the US Baseline Corn and Soybean Segment Classification Procedure.
N81-29504/0 1080

CORONARY ARTERY BYPASS
The Non-Invasive Evaluation of the Coronary Artery Disease Patient: Clinical, Economic, and Social Issues,
PB82-137951 1134

CORRELATION TECHNIQUES
Rank Correlation Coefficients as Optimality Measures for Ordinal Cluster Methods.
AD-A107 109/1 1196

Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236

CORROSION
Boiling Heat Transfer in Confined Space.
AD-A107 363/4 1200

Corrosion Mechanism of Cu-9.4 Ni-1.7 Fe Alloy in 3.4 WT.% NaCl Solution with and without Sulfide Contamination.
AD-A107 393/1 1149

Method of Neutralizing the Corrosive Surface of Amine-Cured Epoxy Resins.
PAT-APPL-6-293 412 1195

High Temperature Sulfidation of Cobalt and Cobalt Alloys. 1970-1981 (Citations from the NTIS Data Base).
PB82-858580 1193

CORROSION INHIBITORS
Corrosion Protection of Metals and Metal Alloys. 1976-1981 (Citations from the Energy Data Base).
PB82-858986 1193

CORROSION PREVENTION
Corrosion Protection of Metals and Metal Alloys. 1976-1981 (Citations from the Energy Data Base).
PB82-858986 1193

CORROSION PROTECTION
Zinc and Zinc Alloys as Protective Coatings. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859935 1190

CORROSION RESISTANCE
The Oxidation and Corrosion Resistance of Nitrided Iron Alloys.
AD-A107 516/7 1192

COSMIC GAMMA BURSTS
Thermonuclear Model for gamma -Ray Bursts.
DE81030835 1082

COSMIC RAYS
A Review and Interpretation of Recent Cosmic Ray Beryllium Isotope Measurements.
N82-12020/5 1083

COSMONAUTS
Hungarian Cosmonaut in Space.
N82-11097/4 1272

COST ALLOCATION
The Federal Side of Traditional Telecommunications Cost Allocations,
PB82-128976 1234

Revenue and Cost Allocations: Policy Means and Ends in the Railroad and Telecommunications Industries,
PB82-129065 1098

The Traditional State Side of Telecommunications Cost Allocations,
PB82-129107 1235

COST ANALYSIS
Update of Cost Information Contained in a Previous GAO Report on Specific Aspects of the Clinch River Breeder Reactor Project.
AD-A106 918/6 1246

The Veterans Administration's Efforts to Consolidate Computer Programming Resources at a Single Location.
AD-A107 197/6 1108

Revenue and Cost Allocations: Policy Means and Ends in the Railroad and Telecommunications Industries,
PB82-129065 1098

Methods for Evaluating Costs of Automated Hospital Information Systems.
PB82-134073 1096

COST ESTIMATES
Preliminary Analysis of Technical Risk and Cost Uncertainty in Selected DARPA Programs.
AD-A107 402/0 1090

Methods for Allocating Highway Costs.
PB82-130501 1211

COST OVERRUNS
Preliminary Analysis of Technical Risk and Cost Uncertainty in Selected DARPA Programs.
AD-A107 402/0 1090

COST REDUCTION
An Algorithm for Minimum-Cost Set-Point Ordering in a Cryogenic Wind Tunnel.
N82-11090/9 1228

COSTS
Tightening Eligibility Standards Could Cut Involuntary Retirement Costs by Millions of Dollars.
AD-A106 842/8 1105

Storage Cost Data on CCC-Owned Dairy Commodities.
AD-A106 892/3 1137

COULOMB POTENTIAL
Upper Limits for the Number of Bound States Associated with the Yukawa Potential,
PB82-140625 1261

COUNTERCURRENT FLOW
1/5-Scale Countercurrent Flow Data Presentation and Discussion.
NUREG/CR-2106 1248

COUNTERMEASURES
Mine/Countermine Problems During Winter Warfare.
AD-A107 047/3 1231

COUPLING (INTERACTION)
Compressional-Shear Wave Coupling Induced by Velocity Gradients in Marine Sediments.
AD-A107 026/7 1252

COUPLINGS
Railroad Yard Simulation Model: Description and Computer Program Users' Manual.
PB82-138686 1222

COURTS OF LAW
Specialized Courts: Housing Justice in the United States. Executive Summary,
PB82-145012 1119

COVALENT BONDS
Surface and Defect Excitations in Covalently Bonded Solids.
AD-A107 064/8 1263

COWLINGS
Low Speed Testing of the Inlets Designed for a Tamden-Fan V/STOL Nacelle.
N82-11042/0 1077

CRABS
Ontogeny of Respiratory and Growth Responses of Larval Mud Crabs Rhithropanopeus harrisii Exposed to Different Temperatures, Salinities and Naphthalene Concentrations.
AD-A107 022/6 1155

CRACK PROPAGATION
Thresholds for Fatigue Initiation and Propagation and Plastic Work in HY80 and HY130 Steels.
AD-A106 946/7 1191

Flaw Growth of 7075, 7475, 7050 and 7049 Aluminum Alloy Plate in Stress Corrosion Environments: 4-Year Marine Atmosphere Results.
N82-11181/6 1192

Fracture Mechanics of Cellular Glass.
N82-11209/5 1189

KEYWORD INDEX

CRACKS
Dynamic Crack Curving - A Photoelastic Evaluation.
AD-A107 238/8 1262

Fields near a Rapidly Propagating Crack-Tip in an Elastic Perfectly-Plastic Material.
AD-A107 350/1 1195

CRANCER LAKE DAM
National Dam Safety Program. Crancer Lake Dam (MO 10764), Missouri - Kansas City Basin, Warren County, Missouri. Phase I Inspection Report.
AD-A107 353/5 1205

CRANKCASES
Nitrosamines and Other Hazardous Emissions from Engine Crankcases.
PB82-127960 1210

CREATINE PHOSPHOKINASE
An Analysis of the Isoenzymes of Creatine Phosphokinase and Lactic Dehydrogenase in the Esophagus.
AD-A107 101/8 1120

CREEP
Identification of Wheelset/Rail Creep Coefficients from Dynamic Response Data Using the Maximum Likelihood Parameter Identification Technique.
AD-A107 447/5 1221

CRIME REDUCTION
Stronger Federal Effort Needed in Fight Against Organized Crime.
PB82-139148 1115

CRIMES
Self-Evaluation for Rape-Responsive Organizations. Volume II: A Self-Evaluation Guide for Programs Serving Victims of Rape.
PB82-110214 1130

Self-Evaluation for Rape-Responsive Organizations. Volume III: A Self-Evaluation Guide for Rape-Responsive Community Education Programs.
PB82-110222 1131

Self-Evaluation for Rape-Responsive Organizations. Volume IV: A Self-Evaluation Guide for Rape Responsive Training Programs.
PB82-110230 1131

Rape Reporting: Causes and Consequences,
PB82-133380 1114

Results of Fingerprint Image Quality Experiments,
PB82-133539 1114

Rape Response: A Research Demonstration Project,
PB82-134511 1132

The Prevalence of Rape and Sexual Assault.
PB82-134537 1096

CRITICAL MATERIALS
Proceedings, U.S. Department of Commerce Public Workshop on Critical Materials Needs in the Aerospace Industry, February 9-10, 1981,
PB82-137266 1193

CRITICAL POINT
Prediction of the Critical Line of a Binary Mixture: Evaluation of the Interaction Parameters,
PB82-140583 1154

CRITICAL TECHNOLOGIES
The Critical Technologies Project Executive Summary.
AD-A107 489/7 1097

CROP CALENDARS
Evaluation of Spring Wheat and Barley Crop Calender Models for the 1979 Crop Year.
N81-29508/1 1081

CROP INVENTORIES
Development of Advanced Acreage Estimation Methods.
N81-29495/1 1156

The Multicategory Case of the Sequential Bayesian Pixel Selection and Estimation Procedure.
N81-29498/5 1198

Users Manual for the US Baseline Corn and Soybean Segment Classification Procedure.
N81-29504/0 1080

Estimation of Proportions in Mixed Pixels Through Their Region Characterization.
N81-29510/7 1198

CROSS FLOW
Amplified Crossflow Disturbances in the Laminar Boundary Layer on Swept Wings with Suction.
N82-11391/1 1078

CROSS POLARIZATION
SMMR Data Set Development for GARP.
N82-11512/2 1085

CRSS SYSTEM
Colorado River Simulation System: An Executive Summary,
PB82-139387 1161

CRUDE OIL
A Summary of Environmental Geologic Studies on the Southeastern United States Atlantic Outer Continental Shelf, 1977-1978.
PB82-109273 1158

Marine and Estuarine Pollution.
PB82-128174 1136

Alaska OCS Socioeconomic Studies Program: St. George Basin and North Aleutian Shelf Commercial Fishing Industry Analysis.
PB82-139817 1122

CRUSTACEA
Report of an Amphipod Species New to Ohio: 'Gammarus minus' Say (Amphipoda: Gammaridae).
PB82-132457 1121

CRUSTAL FRACTURES
A Review of an Attempt to Create Shatter Cones with Magnetic Flyer Plate Technology.
N82-11492/7 1158

Crustal Deformation and Seismic Measurements in the Region of Mcdonald Observatory, West Texas.
N82-11695/5 1169

CRYOGENIC COOLING
An Algorithm for Minimum-Cost Set-Point Ordering in a Cryogenic Wind Tunnel.
N82-11090/9 1228

CRYOGENIC WIND TUNNELS
An Algorithm for Minimum-Cost Set-Point Ordering in a Cryogenic Wind Tunnel.
N82-11090/9 1228

CRYSTAL GROWTH
Liquid-Encapsulated Czochralski Growth of InP Crystals.
AD-A107 051/5 1252

Vapor-Phase Epitaxy of GaInAsP and InP.
AD-A107 053/1 1252

Growth of Solid Solution Single Crystals.
N82-11958/7 1253

CRYSTAL LAKE DAM
National Dam Safety Program. No Name 165 (Crystal Lake Dam) (MO 10580), Missouri - Kansas City Basin, Jackson County, Missouri. Phase I Inspection Report.
AD-A107 542/3 1208

CRYSTAL LATTICES
Spatial Separation of Carriers in InAs-GaSb Superlattices.
AD-A107 155/4 1263

Radiation Damage Processes in Silicon,
AD-A107 170/3 1252

CRYSTALLOGRAPHY
NRCC Software Catalog. Volume 1.
LBL-10811 1174

CRYSTALS
Preparation of Large-Diameter GaAs Crystals.
AD-A107 395/6 1252

Point-Defect Sources and Sinks.
DE82000655 1252

CULICIDAE
Culicidae.
AD-A106 954/1 1120

CULTURE MEDIA
Testing of RPMI-1640 as a Nutrient Medium for Fresh Semilunar Valve Storage.
AD-A106 824/6 1140

CURING
The Stability of New Transparent Polymeric Materials: The Epoxy Trimethoxyboroxine System. Part 1: The Preparation, Characterization and Curing of Epoxy Resins and Their Copolymers.
N82-11208/7 1195

CURIUM ALLOYS
Magnetic Susceptibility of Curium Pnictides.
DE82000148 1263

CURIUM PHOSPHIDES
Magnetic Susceptibility of Curium Pnictides.
DE82000148 1263

CURRENT AMPLIFIERS
Tuned Analog Network.
PAT-APPL-6-301 077 1179

CURVE FITTING
Modal Analysis Using a Fourier Analyzer, Curve-Fitting, and Modal Tuning.
N82-11490/1 1262

CUTTING
Cutting Ice with High Pressure Water Jets--Translation.
AD-A106 985/5 1169

CYCLOHEXANONES
Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
PB82-107210 1139

CYCLOPENTANES
Pentamethylcyclopentadienyl Cobaltaboranes Derived from the B5H8(-) and B9H14(-) Ions: Studies in Synthesis and Structure.
AD-A107 457/4 1147

CYCLOPROPANES
Isotope Effect in Gas-Surface Vibrational Energy Transfer. Cyclopropane and Cyclopropane-d6 Isomerization by the VEM Technique.
AD-A107 365/9 1149

CYCLOTRONS
Rf Field Effects on the Cyclotron Arc Source.
DE81030972 1257

CYLINDRICAL BODIES
Surface-Tension Induced Instabilities: Effects of Lateral Boundaries.
N82-11390/3 1262

CYLINDRICAL CHAMBERS
Standard Specification for Air-Brake Reservoirs.
N82-11464/6 1220

CZOCHRALSKI CRYSTALS
Liquid-Encapsulated Czochralski Growth of InP Crystals.
AD-A107 051/5 1252

DAIRIES
Biotechnology in Agricultural Research (Biotechnologie in het Landbouwkundig Onderzoek).
PB82-140450 1134

DAIRY PRODUCTS
Storage Cost Data on CCC-Owned Dairy Commodities.
AD-A106 892/3 1137

DAMAGE
Radiation Damage Processes in Silicon,
AD-A107 170/3 1252

Charged Particle Simulation of Fast Neutron Damage.
AD-A107 394/9 1245

DAMPING
New Estimation Method for Flutter or Divergence Boundary from Random Responses at Subcritical Speeds.
N82-11034/7 1077

DAMS
Water, Watts, and Wilds Hydropower and Competing Uses in New England.
AD-A107 173/7 1184

Structural Stability Evaluation, Winnibigoshish Dam.
AD-A107 337/8 1205

National Dam Safety Program. Greenhaven Correction Facility Dam (Inventory Number N.Y. 11700), Lower Hudson River Basin, Duchess County, New York. Phase I Inspection Report,
AD-A107 400/4 1206

National Dam Safety Program. Mamaroneck Reservoir Dam (Inventory Number N.Y. 111), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 407/9 1206

National Dam Safety Program. Blind Brook Country Club Dam (Inventory Number N.Y. 123), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 419/4 1208

National Dam Safety Program. Black Tailings Dam (MO 31154), Mississippi - Kaskaskia - St. Louis Basin, Washington County, Missouri. Phase I Inspection Report.
AD-A107 504/3 1208

National Dam Safety Program. No Name 548 Pfizer Inc. Dam (MO 30705), Mississippi - Kaskaskia - St. Louis Basin, Washington County, Missouri. Phase I Inspection Report.
AD-A107 543/1 1208

Susquehanna River Anadromous Fish Studies, Conowingo Dam to Havre De Grace, Maryland.
PB82-135963 1121

Oxygen Dynamics Study - Susquehanna River Below Conowingo Dam, Maryland: Volume I.
PB82-135971 1136

DAPHNIA
Culturing, Harvesting, and Grading 'Daphnia',
PB82-136300 1121

DARPA (DEFENSE ADVANCED RESEARCH PROJECTS AGENCY)
Preliminary Analysis of Technical Risk and Cost Uncertainty in Selected DARPA Programs.
AD-A107 402/0 1090

DARRIEUS ROTORS
Vertical Axis Wind Turbine Control Strategy.
DE81031932 1181

DATA ACQUISITION
Data on Small Business--Much is Collected but it Should be Integrated for Better Use.
AD-A106 851/9 1094

Signal Analysis Van Hardware Operation General Description. Volume 1.
AD-A106 948/3 1238

Techniques for the Computation of Wind, Ceiling, and Extinction Coefficient Using Currently Acquired RPV Data.
AD-A107 094/5 1085

Remote Automatic Weather Station for Resource and Fire Management Agencies.
PB82-107335 1087

Methodology for Collecting Data.
PB82-144379 1096

DATA ANALYSIS
Preliminary Internal Data Screening - a Component of Quantitative Data Analysis in Data Validation.
DE81000502 1095

DATA BASE MANAGEMENT
Preliminary Internal Data Screening - a Component of Quantitative Data Analysis in Data Validation.
DE81000502 1095

Efficient Access of Compressed Data.
LBL-10648 1095

Computer Metatheory for Sequencing and Database Management. 1972-1981 (Citations from the Engineering Index Data Base).
PB82-859372 1177

Computer Metatheory for Sequencing and Database Management. 1976-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-859380 1177

DATA BASE MANAGEMENT SYSTEMS

Addition of Data Feature for FEASIL. Supplement.
AD-A106 992/1 1171

File Analysis and Selection Technique (FAST).
PB82-121815 1095

File Analysis and Selection Technique (FAST). Users Manual.
PB82-121823 1095

DSMS Update System.
PB82-121898 1095

DSMS Update System, User's Guide.
PB82-121906 1095

A Reappraisal of the Use of IDMS for the Radcliffe Science Library Serials Handling System,
PB82-136227 1096

DATA BASES

Addition of Data Feature for FEASIL. Supplement.
AD-A106 992/1 1171

An Aerosol Data Base Format.
AD-A107 032/5 1083

Design and Utilization of an Infrared Data Base for an Advanced Image Interpretation Facility.
AD-A107 529/0 1173

DATA CONVERSION ROUTINES

Conversion of Spu-Universal Disk File to Jsc-Universal Tape Storage: Convrt User's Guide.
N81-29501/6 1174

DATA FILE

Approved Prescription Drug Products with Therapeutic Equivalence Evaluations.
PB82-129164 1141

Codes for Named Populated Places, Primary County Divisions, and Other Locational Entities of the United States (Fourth Update); FIPS PUB-55.
PB82-135146 1176

DATA MANAGEMENT

Data on Small Business--Much is Collected but it Should be Integrated for Better Use.
AD-A106 851/9 1094

Software Technology Transfer and Export Control.
AD-A106 869/1 1097

Addition of Data Feature for FEASIL. Supplement.
AD-A106 992/1 1171

Veterans Administration's Efforts to Improve the Management of Paper Records in the Department of Veterans Benefits. A Major System Acquisition Project.
AD-A107 192/7 1095

Selective Inquiry System (SIS). Operation Manual and Users Manual.
AD-A107 300/6 1173

Guideline Development for Summarization of Tactical Data.
AD-A107 329/5 1234

SPAR Data Set Contents.
N82-11816/7 1273

CLMTIC3 - Tally Incidence of Characters.
PB82-121856 1175

DATA PROCESSING

Signal Analysis Van Hardware Operation General Description. Volume 1.
AD-A106 948/3 1238

Evaluation of Multiband, Multitemporal, and Transformed Landsat Mss Data for Land Cover Area Estimation.
N81-29496/9 1080

Maximum Likelihood Clustering with Dependent Feature Trees.
N81-29502/4 1198

Magnetic Field Satellite (MAGSAT) Data Processing System Specifications.
N82-11103/0 1174

SPAR Data Set Contents.
N82-11816/7 1273

The Effects of Future Information Processing Technology on the Federal Government ADP Situation.
PB82-138181 1177

DATA PROCESSING EQUIPMENT

Signal Analysis Van Hardware Operation General Description. Volume 1.
AD-A106 948/3 1238

Standardization in Microcomputer/LSI Products Via Electronic Information Exchange: JEDEC/EIES Project.
PB82-134735 1176

DATA RECORDING

COPY3 - Copy Sequential Data Sets.
PB82-121864 1175

DATA REDUCTION

An Analysis of Haze Effects on Landsat Multispectral Scanner Data.
N81-29497/7 1080

DATA SOURCES

A Profile of the Medical Technology Industry and Governmental Policies. Appendix A: Review and Assessment of Secondary Data Sources for Developing a Profile of the Medical Technology Industry.
PB82-141847 1141

DATA TRANSCRIBERS

Communications Intelligence: Transcriber Output Enhancement.
AD-A107 296/6 1103

DATA TRANSMISSION SYSTEMS

IRIG-TIME Synchronized Binary Video Data Inserter.
AD-A107 119/0 1233

Flow Control and Routing Techniques for Integrated Voice and Data Networks,
AD-A107 140/6 1233

DC MOTORS

Direct Current Motor Control. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-859562 1178

DE SITTER GROUP

OSp(1,4)-Superfields in Chiral Representation.
JINR-E-2-12364 1261

DECELERATION

Limiting Payload Deceleration during Ground Impact,
AD-A107 371/7 1251

DECISION MAKING

The Use of the Sequential Probability Ratio Test in Making Grade Classifications in Conjunction with Tailored Testing.
AD-A107 367/5 1112

Information on the U.S. Coast Guard's Decision to Purchase the M/V Cowslip Vessel.
AD-A107 374/1 1231

Integration of Theory and Research in Judgment and Decision Making.
AD-A107 385/7 1112

Analysis of the Decision and Verification Stockmarket Tasks Using Additive Stage Process Methods.
AD-A107 502/7 1112

Optimal Control of a Network of Whole Blood Banks: Target Inventory Levels for a Hospital Blood Bank or a Decentralized Regional Blood Banking System.
PB82-106816 1130

DECISION THEORY

Multiple Perspective Concept with Applications to Technology Assessment and Other Decision Areas.
PB82-128604 1091

The Multiple Perspective Concept with Applications to Technology Assessment and Other Decision Areas (Condensed Version),
PB82-128612 1091

Inference Procedure with Uncertainty for Problem Reduction Method,
PB82-131772 1198

DECONTAMINATION KITS

Primary Dermal Irritation Potential of Components of the M-258A-1 Decontamination Kit (Study 2).
AD-A107 381/6 1144

Primary Dermal Irritation Potential of Components of the M-258A-1 Decontamination Kit (Study 4).
AD-A107 382/4 1144

DEDUCTIVE APPROACH

Deductive Synthesis of the Unification Algorithm,
AD-A107 328/7 1173

DEEP SPACE NETWORK

The Telecommunications and Data Acquisition Report.
N82-11279/8 1234

DEFECTS (MATERIALS)

Localized Necking: An Inclined Imperfection Model.
AD-A107 137/2 1191

Radiation Damage Processes in Silicon,
AD-A107 170/3 1252

Study of Graphite/Epoxy Composites for Material Flaw Criticality.
AD-A107 391/5 1190

DEFENSE SYSTEMS

Survivability--The Effort and the Payoff.
AD-A107 108/3 1230

Soviet News and Propaganda Highlights from 'Red Star' (The Official Newspaper of the Soviet Defense Establishment) for the Period 1-31 July 1981.
AD-A107 483/0 1102

Soviet News and Propaganda Analysis from 'Red Star' (The Official Newspaper of the Soviet Defense Establishment) for the Period 1-31 August 1981. Volume 1, Number 8, 1981.
AD-A107 484/8 1102

DEFORMATION

Structural Design of a Large Deformable Primary Mirror for a Space Telescope.
AD-A107 260/2 1256

Review of Current Capabilities for the Measurement of Stress, Displacement, and in Situ Deformation Modulus.
ONWI-95 1158

DEGASSERS

Degassing Supersaturated Water for Fish Culture,
PB82-136623 1121

DELIVERY

Twenty-Five Innovations from Abroad.
PB82-138322 1093

DELIVERY OF HEALTH CARE

Evaluation of the Colorado Clincial Psychology/Expanded Mental Health Benefits Experiment. Volume V: Impact of the Experiment on the Use, Cost, and Delivery of Medicare Services.
PB82-136193 1134

DEMAND (ECONOMICS)

The Marketing of Alcoholic Beverages. Phase II: An Analytical Framework for Information About Marketing Practices and Consumer Purchasing of Beverage Alcohol Products.
PB82-135278 1099

The Marketing of Alcoholic Beverages. Phase I: Literature Report,
PB82-135286 1099

DEMODULATORS

Simulation and Development of a PCSFSK Demodulator.
AD-A107 055/6 1233

DEMOGRAPHY

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DEMONSTRATION PLANTS

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ORO-3054-T3(App.G) 1147

DEMONSTRATIONS

Synthetic Fuels Corporation's Management of Demonstration Projects Would Be Limited.
AD-A106 920/2 1266

DENATURED FUEL

Interim Assessment of the Denatured exp 233 U Fuel Cycle: Feasibility and Nonproliferation Characteristics.
ORNL-5398(Exec.Sum.) 1248

DENDROCTONUS PONDEROSAE

Monoterpenes of Lodgepole Pine Phloem as Related to Mountain Pine Beetles.
PB82-107293 1081

DENGUE VIRUS

Studies on the Rapid Detection of Dengue Virus Antigen by Immunofluorescence and Radioimmunoassay,
PB82-136052 1133

DENSIMETERS

Densities of NaCl, MgCl2, Na2SO4, and MgSO4 Aqueous Solutions at 1 atm from 0 to 50 C and from 0.001 to 1.5 m.
AD-A107 207/3 1149

DENSITY

Densities of NaCl, MgCl2, Na2SO4, and MgSO4 Aqueous Solutions at 1 atm from 0 to 50 C and from 0.001 to 1.5 m.
AD-A107 207/3 1149

DENSITY (MASS/VOLUME)

Propagation of Density Fluctuations in Nonuniform Fluids: Simple Models,
PB82-140591 1154

DENSITY MEASUREMENT

Improved Simulation of Aerosol, Cloud, and Density Measurements by Shuttle Lidar.
N82-11688/0 1085

Improvement of Device (CMD) for Monitoring the Consolidation of Plastic Concrete.
PB82-132390 1219

DENTAL CARE

Predictability of Dental Emergencies by Panography.
AD-A107 272/7 1123

DENTAL CARIES

Dental Emergencies Occurring among U.S. Army Recruits.
AD-A107 271/9 1123

Comparison of the Caries-Preventive Effects of Neutral Sodium Fluoride and Acidulated Phosphate Fluoride.
PB82-135203 1132

DENTAL EQUIPMENT

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DENTAL PROSTHESES

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DENTISTRY

Dental Emergencies Occurring among U.S. Army Recruits.
AD-A107 271/9 1123

Predictability of Dental Emergencies by Panography.
AD-A107 272/7 1123

An Assessment of the Dental Needs of Army Recruits.
AD-A107 290/9 1123

DEOXYRIBONUCLEIC ACIDS
A New Method for Determination of Anti-Double Strand DNA Antibodies, Trypanosoma Equiperdium Immunofluorescent Method,
PB82-129636 1131

DEPARTMENT OF AGRICULTURE
GAO Comments on the Impact of the USDA Reorganization of Nutrition.
AD-A106 940/0 1089

DEPARTMENT OF DEFENSE
Follow-Up on Actions to Improve Coordination and Utilization of Human Resources Research and Development.
AD-A107 179/4 1107

The Critical Technologies Project Executive Summary.
AD-A107 489/7 1097

DEPLETION
Cyclic Nucleotides in Tissues During Long-Term Hypokinesia.
N82-11757/3 1144

DEPOSITION
Intrinsic Stress in Thin Films Deposited on Anisotropic Substrates and its Influence on the Natural Frequencies of Piezoelectric Resonators.
AD-A107 014/3 1170

DESALINATION
Densities of NaCl, MgCl2, Na2SO4, and MgSO4 Aqueous Solutions at 1 atm from 0 to 50 C and from 0.001 to 1.5 m.
AD-A107 207/3 1149

DESCENT TRAJECTORIES
Study of Meteorological Conditions Along Actual or Proposed Reentry Trajectories.
AD-A107 035/8 1273

DESULFURIZATION
Thermodynamic Data for Flue-Gas Desulfurization Processes.
DE81030545 1150

DESULFURIZING
Coal Desulfurization by Low Temperature Chlorinolysis, Phase 3.
N82-11145/1 1209

DETECTION
Estimation of Sensor Detection Probabilities with Data from Concurrent Sensors.
AD-A107 443/4 1178

Dynamic Moire Methods for Detection of Loosened Space Shuttle Tiles.
N82-11434/9 1273

DETONATION WAVES
Model of Direct Initiation of Unconfined Detonations.
AD-A107 446/7 1251

DETONATIONS
How to Make TIGER Perform: A Supplementary Operator's Manual for the TIGER Code.
AD-A106 822/0 1251

DEUTERIDES
Laser-Induced-Fluorescence Studies of Fragment Ions: CH Exp + and CD exp + .
DE82001010 1151

DEVELOPING COUNTRIES
The Minibuses and the Public Transport System of Kuala Lumpur,
PB82-135799 1214

DHDECMP
Applications of DHDECMP Extraction Chromatography to Nuclear Analytical Chemistry.
DE81030134 1150

DIAGNOSIS
A New Method for Determination of Anti-Double Strand DNA Antibodies, Trypanosoma Equiperdium Immunofluorescent Method,
PB82-129636 1131

A New Concept on the Natural Course of Hepatocellular Carcinoma,
PB82-129669 1131

DIAGNOSIS (GENERAL)
Diagnostic and Condition Monitoring System Assessment for Army Helicopter Modular Turboshaft Engines.
AD-A107 315/4 1270

DIAGNOSIS (MEDICINE)
Teleradiology.
AD-A107 431/9 1123

DIALYSIS
Method for Continuous Ambulatory Peritoneal Dialysis.
PATENT-4 239 041 1140

Effects of Exercise Training on Lipid and Carbohydrate Metabolism in Hemodialysis Patients.
PB82-137860 1134

DIAPHRAGMS (MECHANICS)
Improvements to Asbestos Diaphragms and Prospects for Their Replacement (Verbesserung von Asbest-Diaphragmen und deren eventueller Ersatz).
PB82-139445 1154

DICARBOXYLIC ACIDS
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DE81030542 1150

DICHLORODIFLUOROMETHANE
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PB82-107210 1139

DIELECTRIC WAVEGUIDES
Analysis of Periodic Ferrite Slab Waveguides by Means of Improved Perturbation Method.
AD-A107 024/2 1170

DIELECTRICS
Stability and Growth Estimates for Electric Fields in Nonconducting Dielectrics with Memory.
AD-A106 982/2 1263

Testing of a Spacecraft Model in a Combined Environment Simulator.
N82-11106/3 1273

DIESEL ENGINES
Lightweight Diesel Engine Designs for Commuter Type Aircraft.
N82-11068/5 1271

DIESEL FUELS
Fractionation of Diesel Fuel from Petroleum and Paraho Shale Oils.
AD-A107 042/4 1266

Development of Catalytic Systems for the Conversion of Syngas to Jet Fuel and Diesel Fuel and Higher Alcohols. Annual Report.
DE82000067 1151

DIET
Effect of Low Potassium Diet on Rat Exercise Hyperthermia and Heatstroke Mortality.
AD-A107 006/9 1144

The Effects of Diet Calcium, Protein and Acidity on Calcium Retention in the Rat, Particularly as Related to the Inner and Outer Surfaces of Tubular Bone: A Possible Model for the Treatment or Prevention of Osteoporosis.
AD-A107 200/8 1123

USAF Food Habits Study. Part IV. Selections, Quantities Selected, and Perceived Portion Sizes.
AD-A107 307/1 1137

DIFFERENTIAL EQUATIONS
Qualitative Properties of Differential Equations.
AD-A107 492/1 1197

Block Relaxation Strategies.
LA-UR-80-2342 1197

The Use of Computers in Solving Mathematical Problems. 1976-November, 1981 (Citations from the NTIS Data Base).
PB82-802398 1177

DIFFERENTIAL PULSE CODE MODULATION
Differential PCM Systems,
PB82-132804 1178

DIFFERENTIAL PULSE POLAROGRAPHY
Differential Pulse Detection in Liquid Chromatography and Its Application to the Measurement of Organometal Cations.
PB82-133976 1153

DIFFRACTION ANALYSIS
On the Accuracy of Low-Energy Electron Diffraction.
AD-A107 332/9 1252

DIFFUSION
Pore Size, Zinc Penetration, and Zinc Diffusion Studies on PPQ/CA Separators.
AD-A107 354/3 1187

DIFFUSION THEORY
Approximation of Processes and Applications to Control and Communication Theory,
AD-A107 520/9 1197

DIGITAL COMMUNICATIONS
Quadratic-Exponential Moment Error Bounds for Digital Communication Systems.
AD-A106 906/1 1233

Exposure. A Newsletter for Ocean Technologists, Volume 9, Number 4,
AD-A107 104/2 1172

DIGITAL COMPUTERS
'Pseudo', A Macro-Based High Level Language for the PDP-11,
AD-A107 168/7 1172

Programming Support Library (PSL).
AD-A107 248/7 1172

DIGITAL FILTERS
Adaptive Design of Digital Filters.
AD-A106 909/5 1178

DIGITAL SIGNALS
Digital Signal Processing Research.
AD-A107 124/0 1177

DIGITAL SYSTEMS
Simulator Evaluation of Electronic Radio Aids to Navigation Displays--The Miniexperiment.
AD-A107 072/1 1236

Digital Signal Sorting for Digitized Speech in an Environment of Common Digital Data Signals.
AD-A107 266/9 1233

Linear Frequency Modulation Derived Polyphase Pulse-Compression Codes and an Efficient Digital Implementation.
AD-A107 268/5 1238

Application of Digital Troposcatter to the DCS.
AD-A107 303/0 1234

DIGITAL TRANSDUCERS
Digital Ultrasonics Signal Processing: Flaw Data Post Processing Use and Description.
N82-11862/1 1228

DIKES
Confined Disposal Facility at Pointe Mouillee for Detroit and Rouge Rivers.
AD-A107 369/1 1206

DIOXIDES
Competitive Pathways in Chlorine Dioxide Oxidation of Amines: Amide Formation from Acyclic Amines.
AD-A107 242/0 1147

DIOXINS
Dioxins.
PB82-136847 1215

DIRECTIONAL RADIATION DETECTORS
Directional gamma Detector.
PATENT-4 259 575 1241

DIRECTORIES
Directory of Soviet Officials: Republic Organizations.
PB81-928110 1095

DISASTER RELIEF
Requests for Federal Disaster Assistance Need Better Evaluation.
PB82-139122 1115

DISASTERS
Natural Hazards Observer Index. Volume 1, Number 1-Volume 4, Number 3.
PB82-132663 1114

DISCRETE DISTRIBUTION
Developments in Discrete Distributions 1969-1980.
AD-A106 931/9 1196

DISEASES
Myeloproliferative Disorder with Unusual Marrow Chromosome Constitution.
AD-A107 206/5 1123

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PB82-136029 1132

DISKS
Corrosion Mechanism of Cu-9.4 Ni-1.7 Fe Alloy in 3.4 WT.% NaCl Solution with and without Sulfide Contamination.
AD-A107 393/1 1149

DISPLACEMENT
Dynamic Moire Methods for Detection of Loosened Space Shuttle Tiles.
N82-11434/9 1273

DISPLACEMENT RATES
Review of Current Capabilities for the Measurement of Stress, Displacement, and in Situ Deformation Modulus.
ONWI-95 1158

DISPLAY DEVICES
Real-Time 3D X-Ray and gamma-Ray Viewer.
PAT-APPL-6-267 178 1179

DISPLAY SYSTEMS
Simulator Evaluation of Electronic Radio Aids to Navigation Displays, the RA-1 Experiment.
AD-A106 941/8 1236

Simulator Evaluation of Electronic Radio Aids to Navigation Displays--The Miniexperiment.
AD-A107 072/1 1236

The Impact of New Guidance and Control Systems on Military Aircraft Cockpit Design.
AD-A107 356/8 1079

DISPOSAL
Installation Restoration Program. Phase I. Records Search, Hazardous Materials Disposal Sites. Myrtle Beach AFB, South Carolina.
AD-A107 358/4 1205

DISTILLATION
Application of the Method of Inequalities to the Multivariable Control of Binary Distillation Columns,
PB82-134792 1147

DISTRIBUTED COLLECTOR POWER PLANTS
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DISTRIBUTED DATA PROCESSING
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AD-A107 139/8 1236

A Distributed Algorithm for Minimum Weight Directed Spanning Trees.
AD-A107 462/4 1173

DISTRIBUTION SYSTEMS
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PB82-144346 1100

DISTRICT HEATING
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DE82000122 1265

Heat Storage in Ground Water. Part 1. Study of Ground Water Reservoirs.
NE-PROJ-2060591(Pt.1) 1188

Heat Storage in Ground Water. Part 2. Study of Distribution Systems.
NE-PROJ-2060591(Pt.2) 1188

DITHIOCARBAMIC ACID/ETHYLENE-BIS
Treatability Studies of Pesticide Manufacturing Wastewaters: Ethylenebisdithiocarbamate Fungicides.
PB82-107566 1210

DIURNAL VARIATIONS
Variations in Atmospheric Angular Momentum.
N82-11690/6 1085

Time-Variable Earth's Albedo Model Characteristics and Applications to Satellite Sampling Errors.
N82-11723/5 1085

Some Analysis on the Diurnal Variation of Rainfall over the Atlantic Ocean.
N82-11724/3 1087

DIVERS
Comparisons of Performance Effectiveness Among Divers.
AD-A106 912/9 1106

DIVERSITY RECEPTION
Cross Correlation in a Space-Diversity System on a Military Vehicle.
AD-A107 114/1 1178

DMSO
Impact of Energy-Related Pollutants on Chromosome Structure. Progress Report, January 1, 1981-December 31, 1981.
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DNA
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ORO-2832-213 1143

DOCUMENT ANNOUNCEMENT
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PB82-132846 1096

DOCUMENTS
Management of the Department of State Office of Passport Services Needs to be Improved.
AD-A106 880/8 1088

Atomic Physics 7.
AD-A107 089/5 1148

An Analysis of Research Publications Supported by NIH (National Institutes of Health) 1970-1976: NIH and NCI (National Cancer Institute).
PB82-108614 1130

DOMESTIC
Improvements in Department of the Interior Leasing of Potential Aluminum Resources Are Necessary for More Timely Decisionmaking.
AD-A106 886/5 1191

Follow-up Report on Domestic Aluminum Resources: Dilemmas of Development.
AD-A106 901/2 1191

DOPAMINE
Dopamine Depletion Slows Retinal Transmission.
PB82-127432 1142

DOPING
Solitons in Polyacetylene: Effects of Dilute Doping on Optical Absorption Spectra.
AD-A106 964/0 1148

The Chemistry of Polyacetylene Doping.
AD-A107 165/3 1195

(13)C NMR of AsF5 Doped Polyacetylene.
AD-A107 167/9 1149

DORMANCY
An Approach for Assessing Missile System Dormant Reliability.
AD-A107 519/1 1232

DOSIMETRY
LWR Pressure Vessel Irradiation Surveillance Dosimetry.
NUREG/CR-1241-V4 1246

DRAG
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PB82-802372 1254

DRAG REDUCING FLUIDS
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DRAG REDUCTION
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DRAINAGE
Surface Drainage Design for Airfields and Heliports in Arctic and Subarctic Regions.
AD-A107 293/3 1205

DREDGED MATERIALS
Biological Activity and Chemical Characteristics of Dredge Material from 10 Sites on the Upper Mississippi River.
AD-A107 276/8 1135

Confined Disposal Facility at Pointe Mouillee for Detroit and Rouge Rivers.
AD-A107 369/1 1206

DREDGING
Maintenance Dredging & Confined Disposal Facility for the Crooked River Portion of Michigan's Inland Route and the Operation, Maintenance, & Proposed Public Use Facilities for the Alanson Lock and Weir, Michigan.
AD-A106 934/3 1204

Maintenance Dredging of the Federal Navigation Channels in the St. Clair River, Michigan.
AD-A106 935/0 1204

Maintenance Dredging of the Federal Navigation Channels in the Saginaw River and Saginaw Bay, Michigan.
AD-A106 936/8 1204

Final Environmental Impact Statement on Modifications to Monroe Harbor, Michigan.
AD-A106 979/8 1204

Ontonagon Harbor Operation and Maintenance Activities. Lake Superior.
AD-A107 090/3 1204

Maintenance Operations of the Federal Navigation Channels and Structures at Bolles Harbor, Michigan.
AD-A107 368/3 1206

Maintenance Dredging of the Federal Navigation Channels in the Detroit River, Michigan.
AD-A107 370/9 1206

DRILLING FLUIDS
Influence of Drilling Muds on the Primary Chemosensory Neurons in Walking Legs of the Lobster, 'Homarus americanus'.
PB82-128190 1136

DRONES
A True Air Speed Sensor for Miniature Unmanned Aircraft.
AD-A106 967/3 1079

DROUGHT
The Environmental Vegetation Index: A Tool Potentially Useful for Arid Land Management.
N81-29505/7 1081

DRUG ABUSE
Smoking and Health, A Report of the Surgeon General.
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DRUG ADDICTION
Behavioral Pharmacology of Human Drug Dependence.
PB82-136961 1141

DRUGS
Chemicals Identified in Human Biological Media.
DE81030813 1141

Approved Prescription Drug Products with Therapeutic Equivalence Evaluations.
PB82-129164 1141

Deviance Within a Model of Superior Formulary Performance.
PB82-134420 1141

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PB82-139106 1142

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DRYING
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DRYING APPARATUS
Energy Efficient Lumber Dry Kiln Using Collectors and Refrigeration System.
PAT-APPL-6-276 764 1196

DUAL-PURPOSE POWER PLANTS
Assessment of an Atmospheric Fluidized-Bed Coal-Combustion Gas-Turbine Cogeneration System for Industrial Application.
ORNL/TM-6626/V1 1187

DUAL RESONANCE MODEL
Comparison of Charged Particle Multiplicity Distributions in p Tilde p and Pp Interactions and Verification of the Dual Unitarization Scheme.
JINR-E-1-12306 1258

DUCTILITY
Localized Necking: An Inclined Imperfection Model.
AD-A107 137/2 1191

Failure Analysis of a Tool Steel Torque Shaft.
N82-11184/0 1193

DUMP COMBUSTORS
An Investigation of Flame Stability in a Coaxial Dump Combustor.
AD-A107 256/0 1264

DUOPLASMATRONS
Distributive Cathodes in Duoplasmatron Ion Sources.
NIIEFA-P-D-0411 1257

DUST
High Concentration Dust Monitor.
PB82-139320 1229

DUST CONTROL
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PB82-858929 1225

DYES
Evaluation of Replacement Red Smoke Dyes for 1-N Methylaminoanthraquinone.
AD-A107 286/7 1190

DYNAMIC LOADS
Dynamic J sub I-R Curve Testing of HY-130 Steel.
AD-A107 040/8 1191

DYNAMIC LOGIC
On the Expressive Power of Dynamic Logic. II,
AD-A107 430/1 1197

DYNAMIC MODELS
New Molding Method of Three-Dimensional Hollow Photoelastic Model and Centrifugal Stress Analysis of Air Cooled Turbine Blade Model.
N82-11067/7 1270

DYNAMIC PROGRAMMING
The Single and Multiple Vehicle Pickup and Delivery Problem: Exact and Heuristic Algorithms.
AD-A107 202/4 1199

DYNAMIC RESPONSE
Nonparametric Identification of a Class of Nonlinear Close-Coupled Dynamic Systems.
N82-11098/2 1272

DYNAMIC TESTS
Advanced Superposition Methods for High Speed Turbopump Vibration Analysis.
N82-11465/3 1225

DYNAMICS
Dynamic Crack Curving - A Photoelastic Evaluation.
AD-A107 238/8 1262

E REGION
Chatanika Radar Measurements during the Auroral E Program.
AD-A107 117/4 1083

EARTH ALBEDO
Time-Variable Earth's Albedo Model Characteristics and Applications to Satellite Sampling Errors.
N82-11723/5 1085

EARTH ATMOSPHERE
Variations in Atmospheric Angular Momentum.
N82-11690/6 1085

EARTH CRUST
Crustal Structure of the Shatsky Rise from Seismic RefractiON Measurements.
AD-A107 027/5 1157

Workshop on Early Crustal Genesis: Implications from Earth.
N82-11691/4 1158

Crustal Deformation and Seismic Measurements in the Region of Mcdonald Observatory, West Texas.
N82-11695/5 1169

EARTH DAMS
National Dam Safety Program. Busch Wildlife Area Lake Number 35 Dam (MO 10092), Mississippi - Kaskaskia - St. Louis Basin, St. Charles County, Missouri. Phase I Inspection Report.
AD-A106 862/6 1203

National Dam Safety Program. A. C. Schneider Lake Dam (MO 31563), Missouri - Kansas City River Basin, Gasconade County, Missouri. Phase I Inspection Report.
AD-A106 863/4 1203

National Dam Safety Program. Crancer Lake Dam (MO 10764), Missouri - Kansas City Basin, Warren County, Missouri. Phase I Inspection Report.
AD-A107 353/5 1205

National Dam Safety Program. Paterno Dam (Inventory Number N.Y. 101), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 401/2 1206

National Dam Safety Program. Lake Casse Dam (Inventory Number N.Y. 1156), Lower Hudson River Basin, Putnam County, New York. Phase I Inspection Report.
AD-A107 405/3 1206

National Dam Safety Program. Kirk Lake Dam (Inventory Number N.Y. 682), Lower Hudson River Basin, Putnam County, New York. Phase I Inspection Report,
AD-A107 408/7 1206

National Dam Safety Program. White Plains Reservoir Dam Number 2 (Inventory Number N.Y. 24), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 409/5 1207

National Dam Safety Program. Long Pond Dam Number 3 (Inventory Number NY 115), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 410/3 1207

National Dam Safety Program. Norwich Water Works Dam Number 1 (Inventory Number NY 347), Susquehanna River Basin, Chenango County, New York. Phase I Inspection Report,
AD-A107 411/1 1207

National Dam Safety Program. Larchwood Lake Dam (Inventory Number NY 727), Susquehanna River Basin, Otsego County, New York. Phase I Inspection Report,
AD-A107 412/9 1207

National Dam Safety Program. Robert L. Bishop Dam (Inventory Number N.Y. 534), Delaware River Basin, Delaware County, New York. Phase I Inspection Report,
AD-A107 413/7 1207

National Dam Safety Program. Norwich Reservoir Number 2 Dam (Inventory Number NY 349), Susquehanna River Basin, Chenango County, New York. Phase I Inspection Report,
AD-A107 414/5 1207

National Dam Safety Program. Leatherwood Creek Number 5 (Inventory Number VA 08902), Roanoke River Basin, Henry County, Virginia. Phase I Inspection Report.
AD-A107 416/0 1207

National Dam Safety Program. Byram Lake Reservoir Dam (Inventory Number N.Y. 1175), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 417/8 1207

National Dam Safety Program. Lake Carmel Dam (Inventory Number N.Y. 100), Lower Hudson River Basin, Putnam County, New York. Phase I Inspection Report,
AD-A107 418/6 1207

National Dam Safety Program. Sparkle Lake Dam (Inventory Number N.Y. 1330), Lower Hudson River Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 420/2 1208

National Dam Safety Program. Lake Lincolndale Dam (Inventory Number N.Y. 102), Lower Hudson River Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 421/0 1208

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AD-A107 486/3 1208

National Dam Safety Program. Kehr's Mill Trail Upper Dam (MO 11636), Missouri - Kansas City Basin, St. Louis County, Missouri. Phase I Inspection Report.
AD-A107 487/1 1208

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AD-A107 540/7 1208

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AD-A107 542/3 1208

TLUSH: A Computer Program for the Three-Dimensional Dynamic Analysis of Earth Dams,
PB82-139940 1216

EARTH MANTLE

Crustal Structure of the Shatsky Rise from Seismic RefractiON Measurements.
AD-A107 027/5 1157

Hotspots, Polar Wander, Mesozoic Convection and the Geoid.
N82-11694/8 1158

EARTH (PLANET)

Workshop on Early Crustal Genesis: Implications from Earth.
N82-11691/4 1158

EARTH PLANETARY STRUCTURE

Hotspots, Polar Wander, Mesozoic Convection and the Geoid.
N82-11694/8 1158

Study of the Time Evolution of the Lithosphere.
N82-11696/3 1157

EARTH ROTATION

Variations in Atmospheric Angular Momentum.
N82-11690/6 1085

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PB82-859596 1083

EARTHQUAKES

The Bermuda Earthquake of March 24, 1978: A Significant Oceanic Intraplate Event.
AD-A107 273/5 1168

Crustal Deformation and Seismic Measurements in the Region of Mcdonald Observatory, West Texas.
N82-11695/5 1169

Probabilistic Analysis of Seismic Response of Multi-Supported Structures on Soft Soils (Analisis Probabilistico de la Respuesta Sismica de Estructuras Sobre Varios Apoyos en Suelos Blandos),
PB82-135377 1226

Design of Concrete Walls with Shear Failure (Diseno de Muros de Concreto Con Falla Por Cortante),
PB82-135385 1226

TLUSH: A Computer Program for the Three-Dimensional Dynamic Analysis of Earth Dams,
PB82-139940 1216

EAST MESA GEOTHERMAL FIELD

Case Study Data Base Companion Report 3 to Simulation of Geothermal Subsidence (LBL-10571).
LBL-10839 1166

EAST WEST RELATIONS

Soviet News and Propaganda Highlights from 'Red Star' (The Official Newspaper of the Soviet Defense Establishment) for the Period 1-31 July 1981.
AD-A107 483/0 1102

Soviet News and Propaganda Analysis from 'Red Star' (The Official Newspaper of the Soviet Defense Establishment) for the Period 1-31 August 1981. Volume 1. Number 8, 1981.
AD-A107 484/8 1102

EATON DAM

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AD-A107 399/8 1206

ECOLOGY

An Assessment of Wetland Habitat Establishment at a Central Florida Phosphate Mine Site.
PB82-130808 1211

Evaluation of Existing Marine Intertidal and Shallow Subtidal Biologic Data,
PB82-134065 1155

Distribution and Abundance of Marine Birds and Mammals Wintering in the Kodiak Area of Alaska.
PB82-140187 1155

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PB82-146333 1155

Radioecology. 1976-1981 (Citations from the Energy Data Base).
PB82-858895 1137

ECONOMETRICS

Development of Compatible State - SMSA Econometric Models.
PB82-133497 1099

Development of Compatible State - SMSA Econometric Models: Appendices.
PB82-133505 1099

ECONOMIC ANALYSIS

Logistics Concerns over Navy's Guided Missile Frigate FFG-Class.
AD-A107 500/1 1224

Technical and Economic Aspects of Hydrogen Storage in Metal Hydrides.
N82-11223/6 1268

Forest Policy Project Module IV A: Socioeconomic Impact Assessment and Module IV B: Environmental Impact Assessment.
PB82-108085 1081

Alternative Forest Policies for the Pacific Northwest: Study Module V.
PB82-109125 1082

Coal Cooperative Efficiency Program: Small Mine Operations.
PB82-109901 1166

Profiles of Automotive Suppliers Industries-Engineered Mechanical Components and Systems: Volume I, Text.
PB82-129503 1098

Profiles of Automotive Suppliers Industries-Engineered Mechanical Components and Systems: Volume II, Appendices.
PB82-129511 1098

User Charge Revenues for Wastewater Treatment Plants--Insufficient to Cover Operation and Maintenance.
PB82-137761 1215

Noise Pollution Economics. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802646 1217

ECONOMIC ASSISTANCE

An Evaluation of Farmers Home Administration's Economic Emergency Loan Program Objectives to Determine the Programs Effectiveness and the Need for the Program.
PB82-134727 1092

ECONOMIC DEVELOPMENT

Riverport and Transportation Plan for the City of Madison Port Authority, Madison, Indiana. Final Preliminary Plan (Revised).
PB82-131541 1211

Final Report of the Research Institute for Community Economic Development, St. Louis, Missouri, June 1, 1978-September 14, 1979.
PB82-131590 1098

New England Economy Project: Case Study Summaries, Policy Analysis, and Research Methodology,
PB82-131608 1098

Support Services for the Turtle Mountain Shopping Center.
PB82-134255 1099

Urban Infill: Opportunities and Constraints.
PB82-144304 1216

Relevance to HUD of Recent Scholarly Research in Urban Economics,
PB82-144452 1101

Northeast Municipal Economic Development. A National League of Cities Study of Municipal Economic Development Needs, Capacities and Perceptions in the Northeast,
PB82-144502 1101

Can Community Economic Development Meet the Fiscal Needs of Municipalities. Economic Growth and Fiscal Stress in Three Northeast Cities,
PB82-144510 1101

Let's Make a Deal or On the Way to Public - Private Partnerships,
PB82-144536 1093

State Tax Policy and Urban Economic Development,
PB82-144544 1216

ECONOMIC DEVELOPMENT ADMINISTRATION

A Preliminary Examination of EDA Feasibility Studies.
PB82-126533 1091

ECONOMIC FACTORS

Tourism and Vacation Travel: State and Local Government Planning. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802505 1120

ECONOMIC IMPACT

The Role of the Armed Forces in the Mexican Economy in the 1980's.
AD-A107 509/2 1097

Alaska OCS Socioeconomic Studies Program: St. George Basin and North Aleutian Shelf Commercial Fishing Industry Analysis.
PB82-139817 1122

Alaska OCS Socioeconomic Studies Program: St. George Basin Petroleum Development Scenarios, Anchorage Impact Analysis.
PB82-139825 1216

ECONOMIC MODELS

Development of Compatible State - SMSA Econometric Models.
PB82-133497 1099

Development of Compatible State - SMSA Econometric Models: Appendices.
PB82-133505 1099

Energy Conservation and the Demand for Labor: Evidence from Aggregate Data.
PB82-134180 1099

Using CWBH Data to Evaluate the Methods Used in the Urban Institute's Simulation Model of Unemployment Insurance Benefits.
PB82-134206 1110

Assessing the Effects of the Section 8 Program Using the Urban Institute Housing Market Model,
PB82-144445 1101

EDDY CURRENTS

COMPUMAG: Papers Presented by Members of the Laboratory at the Conference of the Computation of Electromagnetic Field, Chicago, 14-17 September, 1981,
PB82-134164 1253

EDDY VISCOSITY

Higher-Level Simulations of Turbulent Flows.
N82-11395/2 1254

EDGE LOADING

Aeroacoustic Theory for Noncompact Wing-Gust Interaction.
N82-11071/9 1078

EDITING ROUTINES

CLMTIC3 - Tally Incidence of Characters.
PB82-121856 1175

EDITORS

The Automatic Generation of Syntax Directed Editors.
AD-A107 078/8 1171

EDUCATION

Advancement in Drug Free Therapeutic Community Treatment.
PB82-132796 1114

EFFECTIVE PERCEIVED NOISE LEVELS

SEL and EPNL Noise Duration Coefficients for the 747 and T-38 Aircraft.
N82-11860/5 1078

EFFICIENCY

Energy-Efficient and Cost-Effective Equipment Should be Installed in New Government Housing.
AD-A106 900/4 1199

Evaluating Program and Mangerial Efficiency: An Application of Data Envelopment Analysis to Program Follow Through.
AD-A107 007/7 1089

Communications Intelligence: Transcriber Output Enhancement.
AD-A107 296/6 1103

ELASTIC BENDING

An Improved Transverse Shear Deformation Theory for Laminated Antisotropic Plates.
N82-11488/5 1262

ELASTIC PROPERTIES

Anisotropic Elastic Constants of a Fiber-Reinforced Boron-Aluminum Composite.
PB82-134016 1191

ELDERLY PERSONS

Annual Housing Survey: 1973. Housing Characteristics of Older Americans in the United States.
PB82-144312 1115

ELECTRIC BATTERIES

Temperature Limitations of Alkaline-Battery Electrodes. Part 1. The Electrochemical Kinetic Behavior of Iron, Nickel, and Zinc in Concentrated Sodium Hydroxide Solutions. Final Report.
DE81027235 1187

Lead Batteries. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802760 1188

ELECTRIC CONDUITS

EMP/EMI Hardening of Electrical Conduit Systems.
AD-A107 133/1 1171

ELECTRIC DISCHARGES

Voltage Gradients in Solar Array Cavities as Possible Breakdown Sites in Spacecraft-Charging-Induced Discharges.
N82-11107/1 1186

ELECTRIC FIELDS

Stability and Growth Estimates for Electric Fields in Nonconducting Dielectrics with Memory.
AD-A106 982/2 1263

ELECTRIC GENERATORS

Active Superconductive Generator Development 400-Horsepower Generator Design.
AD-A107 513/4 1185

ELECTRIC NETWORKS

Concept for a Power System Controller for Large Space Electrical Power Systems.
N82-11109/7 1177

ELECTRIC POWER

Burdensome and Unnecessary Reporting Requirements of the Public Utility Regulatory Policies Act Need to be Changed.
AD-A106 904/6 1180

Utility Rate Guide for SOLCOST Data Bank Cities.
DE82000468 1268

National Electric Rate Book: Rhode Island.
DOE/EIA-0093 1097

State Flows of Energy in 1975.
ORNL/TM-6977 1183

ELECTRIC POWER DISTRIBUTION

High Voltage Direct Current Network Modeling and Simulation. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-858796 1177

ELECTRIC POWER PLANTS

Elimination of Federal Funds for the Heber Project will Impede Full Development and Use of Hydrothermal Resources.
AD-A106 916/0 1180

Federal Energy Regulatory Commission Needs to Act on the Construction-Work-in-Progress Issue.
AD-A106 924/4 1180

ELECTRIC POWER PRODUCTION

Elimination of Federal Funds for the Heber Project will Impede Full Development and Use of Hydrothermal Resources.
AD-A106 916/0 1180

ELECTRIC POWER TRANSMISSION

High Voltage Direct Current Network Modeling and Simulation. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-858796 1177

ELECTRIC-POWERED VEHICLES

Method for Estimating Technological Penetration Rates in Commercial Automobile Fleets.
DE82000433 1221

Reactive Metal-Air Batteries for Automotive Propulsion. Final Report, August 1, 1978-November 30, 1979.
LMSC-D-683375 1188

ELECTRIC PROPULSION

Study of Electrical and Chemical Propulsion Systems for Auxiliary Propulsion of Large Space Systems. Volume 1: Executive Summary.
N82-11110/5 1271

Study of Electrical and Chemical Propulsion Systems for Auxiliary Propulsion of Large Space Systems, Volume 2.
N82-11111/3 1271

ELECTRIC RACEWAYS

Site Investigation and Construction of the Cardiff Cable Tunnel,
PB82-135336 1214

ELECTRIC UTILITIES

National Electric Rate Book: Rhode Island.
DOE/EIA-0093 1097

1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix A: Energy Storage Coil and Superconductor.
LA-7885-MS(V.2) 1188

1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix B: Cost Study, High-Purity Aluminum Production.
LA-7885-MS(V.3) 1188

1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix D: Superconductive Magnetic Energy Storage Cavern Construction Methods and Costs.
LA-7885-MS(V.5) 1188

ELECTRICAL CONDUCTIVITY

Inter-Soliton Electron Hopping Transport in Trans-(CH)x.
AD-A106 966/5 1263

ELECTRICAL INDUSTRY

Analysis of Federal Funding for Electric Utility R&D Projects.
AD-A106 888/1 1088

ELECTRICAL INSULATION

Low Temperature Growth and Electrical Characterization of Insulators for GaAs MISFETS.
N82-11959/5 1171

High Voltage Direct Current Insulators and Insulation Methods. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-858853 1171

ELECTRICAL INSULATORS

High Voltage Direct Current Insulators and Insulation Methods. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-858853 1171

ELECTRICAL LASERS

Device Development Program for Efficient Excitation of a Blue-Green Laser.
AD-A107 073/9 1255

ELECTRICAL RESISTIVITY

The Effects of Impurities on the Performance of Silicon Solar Cells.
N82-11548/6 1187

Conductivity Mobility, Hall Mobility, and Resistivity in p-Type Silicon.
PB82-135864 1263

ELECTRICITY

Questions Concerning DOE's Assignment of Operating and Testing Responsibilities for OTEC-1.
AD-A106 860/0 1179

ELECTROCATALYSTS

Survey on Aging on Electrodes and Electrocatalysts in Phosphoric Acid Fuel Cells.
N82-11545/2 1186

ELECTROCHEMISTRY

Review of the Experimental and Analytical Methods for the Determination of the Pressure-Volume-Temperature Properties of Electrolytes.
AD-A107 208/1 1149

Effects of Temperature on Excited-State Descriptions of Luminescent Photoelectrochemical Cells Employing Tellrium-Doped Cadmium Sulfide Electrodes.
AD-A107 544/9 1150

ELECTRODEPOSITION

Alloy Electrodeposition. 1970-1981 (Citations from the NTIS Data Base).
PB82-858960 1223

Electrodeposition of Copper Base Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859075 1223

Electrodeposition of Cobalt Base Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859919 1223

Electrodeposition of Nickel Base Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859927 1224

ELECTRODES

A Computer Analysis of the Plasma-Boundary Layer Behavior over a Positive Electrode.
AD-A107 455/8 1260

Effects of Temperature on Excited-State Descriptions of Luminescent Photoelectrochemical Cells Employing Tellrium-Doped Cadmium Sulfide Electrodes.
AD-A107 544/9 1150

Survey on Aging on Electrodes and Electrocatalysts in Phosphoric Acid Fuel Cells.
N82-11545/2 1186

ELECTROLYTES

Review of the Experimental and Analytical Methods for the Determination of the Pressure-Volume-Temperature Properties of Electrolytes.
AD-A107 208/1 1149

Adiabatic Partial Molal Compressibilities of Electrolytes in 0.725m NaCl Solutions at 25 c.
AD-A107 223/0 1149

ELECTROLYTIC CELLS

Energy Savings by Means of Fuel-Cell Electrodes in Electro-Chemical Industries. Progress Report, February 1, 1981-April 30, 1981.
DE81030975 1185

ELECTROMAGNETIC FIELDS

COMPUMAG: Papers Presented by Members of the Laboratory at the Conference of the Computation of Electromagnetic Field, Chicago, 14-17 September, 1981,
PB82-134164 1253

Fluid Flow Measurement Using Electromagnetic Fields. 1973-1981 (Citations from the BHRA Fluid Engineering Data Base).
PB82-855768 1254

ELECTROMAGNETIC INTERFERENCE

EMP/EMI Hardening of Electrical Conduit Systems.
AD-A107 133/1 1171

ELECTROMAGNETIC PULSE SIMULATORS

Scale Modeling for the PATRIOT Electromagnetic Pulse Test.
AD-A107 480/6 1232

ELECTROMAGNETIC PULSES

EMP/EMI Hardening of Electrical Conduit Systems.
AD-A107 133/1 1171

ELECTROMAGNETIC RADIATION

Fluctuation Properties of Multiplied-Poisson Light: Measurement of the Photon-Counting Distribution for Radioluminescence Radiation from Glass.
AD-A107 218/0 1256

Proceedings of a Workshop on the Protection of Personnel against Radiofrequency Electromagnetic Radiation Held at the Royal Air Force Establishment, Farnborough, United Kingdom, 6-8 April 1981.
AD-A107 357/6 1143

ELECTROMAGNETIC SCATTERING

Bistatic Scattering Reflection Asymmetry, Polarization Reversal Asymmetry, and Polarization Reversal Reflection Symmetry.
AD-A107 065/5 1238

Theoretical Investigation of Absorptive Processes.
AD-A107 278/4 1253

ELECTROMAGNETIC SHIELDING

EMP/EMI Hardening of Electrical Conduit Systems.
AD-A107 133/1 1171

ELECTROMAGNETIC WAVE PROPAGATION

Electromagnetic Transmission through a Rectangular Aperture in a Perfectly Conducting Plane.
AD-A107 521/7 1264

ELECTRON BOMBARDMENT

Testing of a Spacecraft Model in a Combined Environment Simulator.
N82-11106/3 1273

ELECTRON DENSITY

A Computer Analysis of the Plasma-Boundary Layer Behavior over a Positive Electrode.
AD-A107 455/8 1260

ELECTRON DIFFRACTION

Symmetry Extinction of LEED Beams for Naphthalene Adsorbed on Pt(lll).
AD-A106 963/2 1148

The Nature of the Phase Transition Observed for Monolayers of Azulene on Pt(lll).
AD-A107 067/1 1148

On the Accuracy of Low-Energy Electron Diffraction.
AD-A107 332/9 1252

ELECTRON ENERGY

Investigation of Direct Solar-to-Microwave Energy Conversion Techniques.
N82-11544/5 1186

Oblique Propagation of Electron Thermal Modes Below the Electron Plasma Frequency Without Boundary Effects.
N82-11928/0 1261

ELECTRON IMPACT SPECTRA

Electron-Impact-Ionization Cross Sections and Rates for Highly Ionized Berylliumlike Ions.
PB82-137332 1153

Cross Sections and Rates for Direct Electron-Impact Ionization of Sodiumlike Ions.
PB82-137340 1153

Electron Impact Ionization Cross Sections and Rates for Highly Ionized Atoms.
PB82-137357 1153

ELECTRON ION INTERACTIONS

Electron-Ion Collisions.
PB82-133919 1152

ELECTRON MICROSCOPES

Seismic Isolation of an Electron Microscope.
LBL-10386 1228

KEYWORD INDEX

ELECTRON MICROSCOPY
Scanning Electron Microscopy/1981/III. An International Journal of Scanning Electron Microscopy, Related Techniques, and Applications. Part III,
AD-A107 525/8 1140

ELECTRON MOBILITY
Inter-Soliton Electron Hopping Transport in Trans-(CH)x.
AD-A106 966/5 1263

The Drift, Diffusion, and Reactions of Slow Ions in Gases - O. N. R. Summary Questionnaire.
AD-A107 129/9 1148

ELECTRON-POSITRON INTERACTIONS
Hadronic Cross Sections Study in E exp + E exp - Collisions from 1.350 GeV to 2.125 GeV.
LAL-78-32 1260

ELECTRON PROBES
Applications of the Microscan 9 Microanalyser.
AD-A106 969/9 1148

ELECTRON RADIATION
Radiation Testing of Composite Materials, in Situ Versus Ex Situ Effects.
N82-11116/2 1190

ELECTRON SPECTROSCOPY
Lifetime Broadening of Excited Pyrazine Adsorbed on Ag(111).
AD-A106 854/3 1148

ELECTRON STIMULATED DESORPTION ION ANGULAR DISTRIBUTIONS
The Adsorption of NO on Ni (111): An ESDIAD/LEED Study.
PB82-137373 1153

ELECTRONIC COUNTERMEASURES
Active RF Seeker Analysis for Land Combat Seekers.
AD-A106 947/5 1238

ELECTRONIC SCANNERS
Scanning Electron Microscopy/1981/III. An International Journal of Scanning Electron Microscopy, Related Techniques, and Applications. Part III,
AD-A107 525/8 1140

ELECTRONIC STATES
Formaldehyde: Electronic Structure Calculations for the S(0) and T(1) States.
AD-A107 016/8 1148

ELECTRONIC TECHNICIANS
Mathematics Curricula Requirements and Performance Levels in Navy Class 'C' Electronics Schools.
AD-A106 995/4 1106

ELECTRONS
Application of the Semicontinuum Potential Model to Deduce Localized Electron Trapping Sites in Single Crystals of D-Sorbitol.
AD-A107 156/2 1149

Connection Between the Spin Magnetic Moment of an Electron and the Dirac Monopole.
JINR-R-2-11338 1261

Electron-Impact-Ionization Cross Sections and Rates for Highly Ionized Beryllium-like Ions.
PB82-137332 1153

Cross Sections and Rates for Direct Electron-Impact Ionization of Sodium-like Ions.
PB82-137340 1153

Electron Impact Ionization Cross Sections and Rates for Highly Ionized Atoms.
PB82-137357 1153

ELECTROOPTICS
Optical Processing of Photographic Images.
AD-A107 212/3 1230

ELECTROPLATING
Electroplating of Copper. 1976-1981 (Citations from the Engineering Index Data Base).
PB82-859760 1223

Electroplating of Copper. 1970-1981 (Citations from the NTIS Data Base).
PB82-859778 1223

Electroplating of Chromium. 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859786 1223

Electroplating of Chromium. 1970-1981 (Citations from the NTIS Data Base).
PB82-859794 1223

ELECTRORETINOGRAPHY
Electroretinography. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802687 1142

ELECTROSTATIC PRECIPITATORS
Improvement of Hot-Side Precipitator Performance with Sodium Conditioning--An Interim Report.
PB82-134107 1213

ELECTROSTATIC WAVES
Oblique Propagation of Electron Thermal Modes Below the Electron Plasma Frequency Without Boundary Effects.
N82-11928/0 1261

ELEVATED RAILROADS
Investigation of Design Standards for Urban Rail Transit Elevated Structures.
PB82-130857 1221

ELEVONS
Wind Tunnel Tests of Elevon Gap Heating on the Space Shuttle Orbiter (OH-107).
AD-A107 287/5 1272

ELMO BUMPY TORUS
Ambipolar Potential Formation and Control in Bumpy Tori and Mirrors.
DE81030636 1239

ELONGATION
Model for the Elongation of Boron on Tungsten during Chemical Vapor Deposition.
AD-A106 989/7 1191

EMBANKMENTS
Factor of Safety Charts for Estimating the Stability of Saturated and Unsaturated Tailings Pond Embankments.
PB82-135518 1167

EMBRYOS
Monitoring Calcium in Trout Eggs Exposed to Hydrazine.
AD-A107 138/0 1144

EMERGENCY MEDICAL SERVICES
Fire Department Participation in the Identification and Transportation of Victims of Thermal Injury 'In Central New York State' Exploratory Study.
PB82-106832 1130

EMISSION
Control of Air Pollution from Aviation: The Emission Standard Setting Process.
AD-A107 435/0 1208

EMISSION FACTORS
Compilation of Air Pollutant Emission Factors, Third Edition, Supplement 12.
PB82-107723 1210

EMPIRICAL TECHNIQUES
Evaluating Program and Mangerial Efficiency: An Application of Data Envelopment Analysis to Program Follow Through.
AD-A107 007/7 1089

A Statistical Methodology for Constructing Synthetic Test Workloads.
AD-A107 257/8 1172

EMPLOYMENT
Information on Funding Commitments from Comprehensive Employment and Training Act Titles III and IV during Fiscal Year 1981.
AD-A106 877/4 1106

Labor Market Projections Model: A User's Guide to the Population, Labor Force, and Unemployment Projections Model at Lawrence Berkeley Laboratory.
LBL-11349 1097

Energy Conservation and the Demand for Labor: Evidence from Aggregate Data.
PB82-134180 1099

Employment and Unemployment Among Vietnam Era Veterans: An Analysis of the 1979 National Survey of Veterans,
PB82-136912 1110

An Assessment of Factors Affecting Employment of Temporary Foreign Labor in the East Coast Apple Harvest,
PB82-138678 1110

American Indian Jobs/Skills Bank.
PB82-144478 1111

EMS
Impact of Energy-Related Pollutants on Chromosome Structure. Progress Report, January 1, 1981-December 31, 1981.
DE82000153 1121

ENDANGERED SPECIES
Convention on International Trade in Endangered Species of Wild Fauna and Flora; 1979 Annual Report for the United States of America.
PB82-128646 1098

ENDURANCE (PHYSIOLOGY)
Prediction of Energy Expenditure during Load Carriage at High Altitude.
AD-A106 852/7 1143

ENERGETIC PROPERTIES
Synthesis of Energetic Polymers.
AD-A107 498/8 1147

ENERGY
Research and Development: Systems for Transmitting Energy Through the Intact Skin.
PB82-129321 1142

Biotechnology in Agricultural Research (Biotechnologie in het Landbouwkundig Onderzoek).
PB82-140450 1134

ENERGY CONSERVATION
Energy-Efficient and Cost-Effective Equipment Should be Installed in New Government Housing.
AD-A106 900/4 1199

Options for Establishing an Energy Conservation Consolidated Grant Program.
AD-A106 919/4 1180

Symposium on Commercial Aviation Energy Conservation Strategies, April 2-3, 1981. Papers and Presentations.
AD-A107 106/7 1181

Strategic Analysis of Conservation and Solar Energy Policies.
DE82000252 1181

Saving Half of California's Energy and Peak Power in Buildings and Appliances Via Long-Range Standards and Other Legislation.
LBL-6865 1182

Energy Efficient Buildings Program. Chapter from Energy and Environment Division Annual Report 1978.
LBL-9576 1201

Potential Fuel Conservation from Regulatory Reform of the Trucking Industry.
PB82-130907 1183

Energy Conservation and the Demand for Labor: Evidence from Aggregate Data.
PB82-134180 1099

Right Combination of Measures in the Right Building at the Right Time: Energy Conservation in the Form of Combinations of Measures.
PB82-137035 1202

Municipal Energy Initiatives in the Northeast,
PB82-144569 1184

Energy Conservation: Buildings. 1977-October, 1981 (Citations from the NTIS Data Base).
PB82-802513 1203

ENERGY CONSUMPTION
Prediction of Energy Expenditure during Load Carriage at High Altitude.
AD-A106 852/7 1143

Energy Impacted Area Development Assistance Program's Designation Criteria.
AD-A106 902/0 1180

State Flows of Energy in 1975.
ORNL/TM-6977 1183

Urban Transportation Energy Accounts. Volume I - Procedures. Volume II - Case Study of the Chicago Region.
PB82-135542 1183

ENERGY CONVERSION
Questions Concerning DOE's Assignment of Operating and Testing Responsibilities for OTEC-1.
AD-A106 860/0 1179

Minerals Critical to Developing Future Energy Technologies, Their Availability, and Projected Demand.
AD-A106 903/8 1180

Sputtered Films for Wavelength-Selective Applications.
AD-A107 232/1 1200

ENERGY DEMAND
Worldwide Transportation/Energy Demand, 1975-2000. Revised Variflex Model Projections.
ORNL/Sub-79/45740/1 1183

ENERGY MANAGEMENT
Ohio's 1981 Home Energy Assistance Program.
AD-A106 872/5 1180

Unresolved Issues Remain Concerning U.S. Participation in the International Energy Agency.
AD-A106 879/0 1102

Ineffective Management of the Appropriate Technology Small Grants Program.
AD-A106 882/4 1088

Status of Strategic Petroleum Reserve Activities.
AD-A107 373/3 1266

ENERGY MODELS
BIGMAC: Basic Interactive Geothermal Model with Aquifer Characterization; A User's Guide,
PB82-128679 1183

ENERGY POLICY
Expert Judgments for Policy Analysis.
DE81030997 1181

Strategies for State Participation in OCS Exploration Decisions: Onshore Facilities Related to Offshore Oil and Gas Development.
PB82-136482 1184

Political Aspects of Energy Policy. 1976-1981 (Citations from the Energy Data Base).
PB82-859455 1103

ENERGY RECOVERY
Heat Energy Recovery from Domestic Output Fluids (HERDOF),
PB82-134156 1188

ENERGY SOURCE DEVELOPMENT
Alaska OCS Socioeconomic Studies Program: St. George Basin Petroleum Development Scenarios, Anchorage Impact Analysis.
PB82-139825 1216

ENERGY SOURCES
US Energy Sources and Materials Needs.
LASL-80-10(BRIEF) 1182

ENERGY SUPPLIES
State Flows of Energy in 1975.
ORNL/TM-6977 1183

ENERGY TRANSFER
Isotope Effect in Gas-Surface Vibrational Energy Transfer. Cyclopropane and Cyclopropane-d6 Isomerization by the VEM Technique.
AD-A107 365/9 1149

ENGINE CONTROL
Space Shuttle Main Engine Controller.
N82-11784/7 1273

ENGINE DESIGN
Lightweight Diesel Engine Designs for Commuter Type Aircraft.
N82-11068/5 1271

Integrated Analysis of Engine.
N82-11491/9 1078

ENGINE INLETS
A Summary of V/STOL Inlet Analysis Methods.
N82-11043/8 1077

ENGINEERING
Eliminating Contractor Inspections of Federal Water Projects Could Save Millions.
AD-A106 838/6 1203

ENGINEERING STANDARDS
Rationale Statements for Voluntary Standards - Issues, Techniques, and Consequences.
PB82-135856 1093

ENLISTED PERSONNEL
Initial Skill Training for Navy Enlisted Personnel.
AD-A107 177/8 1107

Performance as a Factor in Enlisted Promotions.
AD-A107 298/2 1108

A Descriptive Analysis of First Term Attrition from U.S. Naval Ships.
AD-A107 510/0 1109

ENTRAINMENT
Investigation of Hydrodynamic and Behavioral Factors That Affect Zooplankton Sampling by Pumps.
PB82-137886 1122

ENTROPY
A New Algorithm for Two-Dimensional Maximum Entropy Power Spectrum Estimation.
AD-A107 123/2 1178

ENVIRONMENT PROTECTION
A Proposed New Policy for Planetary Protection.
N82-11095/8 1272

ENVIRONMENTAL ENGINEERING
Control of Building Engineering Services. Part 1: Background,
PB82-134669 1092

Control of Building Engineering Services. Part 2: A Survey of Proprietary Automation Systems,
PB82-134677 1092

Control of Building Engineering Services. Part 3: A Proposal for a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134685 1092

Control of Building Engineering Services. Part 4: Hardware Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134693 1092

Control of Building Engineering Services. Part 5: Software Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134701 1092

Control of Building Engineering Services. Part 6: Survey of the Control Systems Centre's Building Engineering Services,
PB82-134719 1092

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PB82-144437 1227

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ENVIRONMENTAL IMPACT STATEMENTS
Continental United States Over-The-Horizon-Backscatter (OTH-B) Radar System. Supplement.
AD-A106 870/9 1237

Mitigation of Shore Damage Attributed to the Federal Navigation Structures at Ludington Harbor, Michigan.
AD-A106 932/7 1203

Mitigation of Shore Damage Attributed to the Federal Navigation Structures at Port Sanilac Harbor, Michigan.
AD-A106 933/5 1204

Maintenance Dredging & Confined Disposal Facility for the Crooked River Portion of Michigan's Inland Route and the Operation, Maintenance, & Proposed Public Use Facilities for the Alanson Lock and Weir, Michigan.
AD-A106 934/3 1204

Maintenance Dredging of the Federal Navigation Channels in the St. Clair River, Michigan.
AD-A106 935/0 1204

Maintenance Dredging of the Federal Navigation Channels in the Saginaw River and Saginaw Bay, Michigan.
AD-A106 936/8 1204

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AD-A106 971/5 1204

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AD-A106 979/8 1204

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AD-A107 087/9 1204

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Confined Disposal Facility and Maintenance Dredging of the Les Cheneaux Island Federal Navigation Channels, Michigan.
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AD-A107 148/9 1205

Confined Disposal Facility at Pointe Mouillee for Detroit and Rouge Rivers.
AD-A107 369/1 1206

Maintenance Dredging of the Federal Navigation Channels in the Detroit River, Michigan.
AD-A107 370/9 1206

Draft Environmental Impact Statement: Defense Waste Processing Facility, Savannah River Plant, Aiken, SC.
DE81030992 1243

ENVIRONMENTAL IMPACT STATEMENTS-DRAFT
Tallahassee-Leon County Wastewater Management, Tallahassee, Leon County, Florida.
PB82-106428 1209

Wastewater Facilities Southern Region Area, Palm Beach County, Florida.
PB82-108838 1210

Noise Emission Standards for Construction Equipment: Proposed Wheel and Crawler Tractor Noise Emission Regulation. Part 1. Draft Environmental Impact Statement, Economic Impact Statement. Part 2. Background Document.
PB82-136979 1220

ENVIRONMENTAL IMPACT STATEMENTS-FINAL
Proposed Gulf of Mexico OCS Oil and Gas Sales 67 and 69.
PB82-109430 1210

ENVIRONMENTAL IMPACTS
Forest Policy Project Module IV A: Socioeconomic Impact Assessment and Module IV B: Environmental Impact Assessment.
PB82-108085 1081

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PB82-132770 1212

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PB82-139817 1122

ENVIRONMENTAL POLICY
Expert Judgments for Policy Analysis.
DE81030997 1181

ENVIRONMENTAL SURVEYS
Industrial Hygiene Survey Report at Celotex Corporation, Pittston, Pennsylvania.
PB82-107103 1139

Asbestos Dust and Preliminary Industrial Hygiene Survey at World-Bestos, the Firestone Tire and Rubber Company in New Castle, Indiana.
PB82-107178 1139

Men's Apparel Industrywide Study at Gant Shirtmakers Division of Consolidated Foods, Salisbury, MD.
PB82-107186 1139

Industrial Hygiene Survey Report at U.S. Gypsum Corporation, Birmingham, Alabama.
PB82-107194 1139

Results of Air Samples of Johns-Manville in Marshville, North Carolina.
PB82-107202 1139

Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
PB82-107210 1139

Health Hazard Evaluation Report No. HE-79-14-760 at General Electric Company, Evendale,Ohio,
PB82-107228 1140

Health Hazard Evaluation Report No. HE-80-159-752 at Mountain Bell, Denver, Colorado,
PB82-107236 1140

Men's Apparel Industrywide Study: Fechheimer Bros. Co., Cincinnati, Ohio.
PB82-107269 1140

Proposed Gulf of Mexico OCS Oil and Gas Sales 67 and 69.
PB82-109430 1210

Effects of Synfuel Use.
PB82-132432 1212

Chemical Technology and Economics in Environmental Perspective. Task VI - A Survey of Plasticizers: Epoxies, Linear Polyesters, and Trimellitates.
PB82-136102 1147

Dioxins.
PB82-136847 1215

Performance Tests for the Evaluation of Computerized Gas Chromatography/Mass Spectrometry Equipment and Laboratories,
PB82-137662 1229

Remote Sensing Applied to Environmental Pollution Detection and Management. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802752 1217

ENVIRONMENTAL TESTS
Environmental Failure of Adhesive Bonding in Composites.
AD-A107 538/1 1190

Flaw Growth of 7075, 7475, 7050 and 7049 Aluminum Alloy Plate in Stress Corrosion Environments: 4-Year Marine Atmosphere Results.
N82-11181/6 1192

ENVIRONMENTS
Coal and Nuclear Wastes--Both Potential Contributors to Environmental and Health Problems.
AD-A106 884/0 1135

ENZYMES
An Analysis of the Isoenzymes of Creatine Phosphokinase and Lactic Dehydrogenase in the Esophagus.
AD-A107 101/8 1120

Odorant Responses of Na(+) -K(+) ATPase Activity by Preparations from Paired Turbinals of Rat Olfactory Tissue.
AD-A107 102/6 1142

EPIDEMIOLOGY
9th Scientific Meeting of the International Epidemiological Association.
AD-A107 471/5 1124

EPIDERMIS
Study of Protein Modifications Induced by Phorbol Ester Tumor Promoters in Mouse Skin.
DE81031985 1145

EPITAXIAL GROWTH
Liquid Phase Epitaxial Growth of Hg1-xCdxTe from Te-Rich Solutions.
AD-A107 054/9 1252

Transient Annealing of Arsenic-Implanted Silicon Using a Graphite Strip Heater.
AD-A107 230/5 1222

Liquid-Phase Epitaxial Growth of InP and InGaAsP Alloys.
AD-A107 233/9 1252

EPOXIDES
Interferometric Study of Epoxy Resin Gelation.
DE81030128 1196

EPOXY COMPOSITES
Study of Graphite/Epoxy Composites for Material Flaw Criticality.
AD-A107 391/5 1190

EPOXY COMPOUNDS
Study of Graphite/Epoxy Composites for Material Flaw Criticality.
AD-A107 391/5 1190

EPOXY RESINS
The Stability of New Transparent Polymeric Materials: The Epoxy Trimethoxyboroxine System. Part 1: The Preparation, Characterization and Curing of Epoxy Resins and Their Copolymers.
N82-11208/7 1195

Method of Neutralizing the Corrosive Surface of Amine-Cured Epoxy Resins.
PAT-APPL-6-293 412 1195

EQUAL OPPORTUNITY
EEO System.
PB82-121914 1109

EEO Statistics. Computer Operation Manual.
PB82-121922 1109

EQUATIONS
Weak Compactness of Solution Measures Associated with Random Equations.
AD-A107 144/8 1197

EQUATIONS OF MOTION
Kinematics, Dynamics, and Estimation of Rigid-Body Motion Using Euler Parameters (Quaternions).
AD-A107 537/3 1273

EQUATIONS OF STATE
The Equation of State of D2O Determined from Sound Speeds.
AD-A107 203/2 1149

International One-Atmosphere Equation of State of Seawater.
AD-A107 209/9 1168

EQUIPMENT
Heat Energy Recovery from Domestic Output Fluids (HERDOF),
PB82-134156 1188

EQUIPMENT SPECIFICATIONS
Standard Specification for Industrial Safety-Belt Assemblies.
N82-11278/0 1225

Standard Specification for Apparatus for gamma Radiography.

KEYWORD INDEX

N82-11433/1 1228

Standard Specification for Air-Brake Reservoirs.
N82-11464/6 1220

ERROR ANALYSIS
Quadratic-Exponential Moment Error Bounds for Digital Communication Systems.
AD-A106 906/1 1233

The Automatic Generation of Syntax Directed Editors.
AD-A107 078/8 1171

Time-Variable Earth's Albedo Model Characteristics and Applications to Satellite Sampling Errors.
N82-11723/5 1085

ERRORS
Proton Upsets in LSI Memories in Space.
AD-A107 331/1 1173

ESCADT COMPUTER PROGRAM
ESCADT: A FORTRAN Code for Computing the Positions and Areas of X-Ray Photoelectron Spectral Peaks.
LA-7910 1263

ESTIMATING
New Estimation Method for Flutter or Divergence Boundary from Random Responses at Subcritical Speeds.
N82-11034/7 1077

ESTROGEN RECEPTOR
Determination of Estrogen Receptor in Human Colon Cancer Tissue with Labeled Fluorescence Estradiol (Fluorescein Isothiocyanate),
PB82-129719 1131

ESTUARIES
Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume I,
PB82-131426 1211

Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume II,
PB82-131434 1211

ETCHING
Plasma Etching Technology and Applications. 1970-1981 (Citations from the Searchable Physics Information Notices Data Base).
PB82-859208 1223

ETHANE
Kinetics of Gas Hydrate Formation. Part I: Kinetics of Ethane Gas Hydrate Formation. Part II: Kinetics of Natural Gas Hydrate Formation.
PB82-138868 1153

ETHANOL
Ethanol Production Via Fungal Decomposition and Fermentation of Biomass. Phase II. Semiannual Progress Report, October 1980-March 1981.
DE82000104 1267

ETHANOLS
Effects of Alcohol Fuels on Engine Wear.
AD-A107 136/4 1266

ETHICS
The Army Racial Awareness Program: A Case Study of Program Impact on Personal Values.
AD-A107 535/7 1113

ETHNIC GROUPS
Summary and Recommendations: Conference on Pacific and Asian American Families and HEW-Related Issues.
PB82-107533 1113

ETHYLENE
Solitons in Polyacetylene: Effects of Dilute Doping on Optical Absorption Spectra.
AD-A106 964/0 1148

Photoconductivity in Polyacetylene.
AD-A106 965/7 1194

ETHYLENE/DICHLORO
Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
PB82-107210 1139

ETHYLENE OXIDE
Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
PB82-107210 1139

ETHYLENE PERCHLORO
Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
PB82-107210 1139

EVACUATING (TRANSPORTATION)
A 'Uniformity Principle' for Evacuation Route Allocation,
PB82-140633 1199

EVALUATION
A Methodology for Evaluating Housing in Use: A Case Study Approach,
PB82-104969 1113

Post Occupancy Evaluation of Housing.
PB82-144296 1115

EVAPORATION
Descriptive and Sensitivity Analyses of Watbali: A Dynamic Soil Water Model.
N81-29507/3 1170

EVAPORATORS
Evaporation by Mechanical Vapor Recompression. Technical Progress Report, April 1, 1980-June 30, 1980.
BSDF-38-3Q-80 1137

EXCITATION
Lifetime Broadening of Excited Pyrazine Adsorbed on Ag(111).
AD-A106 854/3 1148

Surface and Defect Excitations in Covalently Bonded Solids.
AD-A107 064/8 1263

EXECUTIVES
Civil Service Reform After Two Years: Some Initial Problems Resolved but Serious Concerns Remain.
PB82-134131 1110

EXERCISE (PHYSIOLOGY)
Prediction of Energy Expenditure during Load Carriage at High Altitude.
AD-A106 852/7 1143

Heat Balance and Transfer in Men and Women Exercising in Hot-Dry and Hot-Wet Conditions.
AD-A107 004/4 1144

Effect of Low Potassium Diet on Rat Exercise Hyperthermia and Heatstroke Mortality.
AD-A107 006/9 1144

Effects of Exercise Training on Lipid and Carbohydrate Metabolism in Hemodialysis Patients.
PB82-137860 1134

EXHAUST EMISSION
Evaluation of the Micro-Carburetor.
N82-11994/2 1271

Current Status of EPA Office of Mobile Source Air Pollution Control Characterization Projects: Summary.
PB82-105909 1269

EXHAUST EMISSIONS
Analyses, Experimental Studies, and Evaluations of Control Measures for Air Flow and Air Quality on and Near Highways. Volume I: Experimental Studies, Analyses, and Model Development.
PB82-133604 1213

EXHAUST GASES
The Debate over Acid Precipitation--Opposing Views--Status of Research.
AD-A106 925/1 1083

EXHAUST SYSTEMS
An Analytical and Experimental Analysis of Factors Affecting Exhaust System Performance in Sea Level Static Jet Engine Test Facilities.
AD-A106 890/7 1269

EXPLOSIVES
Quantum-Mechanical Studies on Chemical Reactivity and Ballistic Chemistry. VII. Semiempirical Molecular Orbital Calculations and Experimental Studies on Relative Chemical Reactivities of Isomeric Tetrazole Derivatives, and their Relationship to the Explosive Properties of some Tetrazole Derivatives.
AD-A107 288/3 1250

Identification or Development of Chemical Analysis Methods for Plants and Animal Tissues.
AD-A107 346/9 1144

EXPORT CONTROLS
The Critical Technologies Project Executive Summary.
AD-A107 489/7 1097

EXPORTS
The Critical Technologies Project Executive Summary.
AD-A107 489/7 1097

Ship Chartering Alternatives for Grain-Exporting Cooperatives.
PB82-130881 1098

EXPOSURE (PHYSIOLOGY)
Monitoring Calcium in Trout Eggs Exposed to Hydrazine.
AD-A107 138/0 1144

EXTRACTIVE METALLURGY
Extractive Metallurgy. 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859000 1193

EXTRATERRESTRIAL RESOURCES
Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.
N82-11989/2 1103

EXTRATROPICAL CYCLONES
A Numerical Study of the Role of Air-Sea Fluxes in Extratropical Cyclogenesis.
AD-A107 508/4 1086

EXXON LIQUEFACTION PROCESS
EDS Coal-Liquefaction Process Development. Phase V. EDS Commercial Plant Study Design Update: Illinois Coal. Volume 2. Base Case.
DOE/ET/10069-T1(V.2) 1146

EDS Coal-Liquefaction Process Development. Phase V. EDS Commercial Plant Study Design Update: Illinois Coal. Volume 3. Market Flexibility Sensitivity Case.
DOE/ET/10069-T1(V.3) 1146

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DOE/ET/10069-T7(V.2) 1146

EYE (ANATOMY)
Dopamine Depletion Slows Retinal Transmission.
PB82-127432 1142

F-1540 RESONANCES
Meson F sub 1 Spin and Parity Measurement.
LPNHEP-T-78-01 1260

F REGION
Empirical F-Region Model Development Based on S3-1 Satellite Measurements,
AD-A107 403/8 1084

FABRICATION
Development of Microfabrication Techniques.
AD-A107 128/1 1222

Solar Cell Development for the Power Extension Package.
N82-11551/0 1187

FACILITIES MANAGEMENT
Control of Building Engineering Services. Part 1: Background,
PB82-134669 1092

Control of Building Engineering Services. Part 2: A Survey of Proprietary Automation Systems,
PB82-134677 1092

Control of Building Engineering Services. Part 3: A Proposal for a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134685 1092

Control of Building Engineering Services. Part 4: Hardware Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134693 1092

Control of Building Engineering Services. Part 5: Software Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134701 1092

Control of Building Engineering Services. Part 6: Survey of the Control Systems Centre's Building Engineering Services,
PB82-134719 1092

FACSIMILE COMMUNICATION
Facsimile Communication. June, 1970-1981 (Citations from the NTIS Data Base).
PB82-856964 1235

FACTOR ANALYSIS
The Formation of Homogeneous Item Sets When Guessing is a Factor in Item Responses.
AD-A107 134/9 1111

FADING
Selective Fading on a Long 8 GHz Line-of-Sight Path in Europe.
PB82-130519 1235

FAILURE
Conrail Needs to Further Improve Inventory Control and Management.
AD-A106 837/8 1088

Predicting Failure of Optical Glass Fibers.
AD-A107 245/3 1189

Worst-Case Prediction of Single-Particle-Induced Permanent Failures in Microelectronics.
AD-A107 309/7 1171

Environmental Failure of Adhesive Bonding in Composites.
AD-A107 538/1 1190

FAILURE ANALYSIS
Failure Analysis of a Tool Steel Torque Shaft.
N82-11184/0 1193

FALLOUT SHELTERS
Proposed New Handbook for the Federal Emergency Management Agency: Radiation Safety in Shelters.
DE82000441 1230

FAMILY PLANNING
Changing Patterns of Fertility: The Impact of Contraceptive Technology on a Maya Village.
PB82-131061 1131

Third Evaluation of the Thailand National Family Planning Program.
PB82-131491 1114

FAR INFRARED RADIATION
Far-Infrared Measurements of Trace Gases.
N82-11698/9 1228

FAR ULTRAVIOLET RADIATION
Testing of a Spacecraft Model in a Combined Environment Simulator.
N82-11106/3 1273

FARADAY EFFECT
SMMR Data Set Development for GARP.
N82-11512/2 1085

FARM CROPS
Food in the Future: Proceedings of a Planning Symposium.
AD-A107 145/5 1079

Information on Peanut Allotment Owners that Lease and Rent Away Rather Than Plant Their Peanut Allotments/Quotas.
AD-A107 377/4 1079

Evaluation of Large Area Crop Estimation Techniques Using Landsat and Ground-Derived Data.
N81-29511/5 1081

An Evaluation of the New York Area Sampling Frame.
PB82-124413 1080

An Assessment of Factors Affecting Employment of Temporary Foreign Labor in the East Coast Apple Harvest,
PB82-138678 1110

FARM MANAGEMENT

Attitudes Toward Cooperatives by Bank Trust and Professional Farm Managers,
PB82-131244 1080

FARMERS HOME ADMINISTRATION

An Evaluation of Farmers Home Administration's Economic Emergency Loan Program Objectives to Determine the Programs Effectiveness and the Need for the Program.
PB82-134727 1092

FARMLANDS

Evaluation of Gravimetric Ground Truth Soil Moisture Data Collected for the Agricultural Soil Moisture Experiment, 1978 Colby, Kansas, Aircraft Mission.
N81-29494/4 1169

FARMS

Special Estate Tax Provisions for Farmers Should be Simplified to Achieve Fair Distribution of Benefits.
AD-A106 857/6 1102

Food in the Future: Proceedings of a Planning Symposium.
AD-A107 145/5 1079

Information on Peanut Allotment Owners that Lease and Rent Away Rather Than Plant Their Peanut Allotments/Quotas.
AD-A107 377/4 1079

Profiles of Basotho Farmers. Part I: Images of Basotho Farmers. Part II: Are the Basotho Subsistence Farmers. Part III: Progressive Farmers in Lesotho.
PB82-132762 1109

Vacation Farm Cooperatives,
PB82-134388 1080

Farm Sector Application of Flow-of-Funds Accounting.
PB82-137738 1093

Southeastern Soil Erosion Control and Water Quality Workshop, November 19-21, 1980, Nashville, Tennessee.
PB82-139502 1081

FAST NEUTRONS

Charged Particle Simulation of Fast Neutron Damage.
AD-A107 394/9 1245

FATIGUE (MECHANICS)

Thresholds for Fatigue Initiation and Propagation and Plastic Work in HY80 and HY130 Steels.
AD-A106 946/7 1191

Corrosion Fatigue of Metals in Marine Environments.
AD-A107 247/9 1191

Mechanisms of Recovering Low Cycle Fatigue Damage in Incoloy 901.
AD-A107 255/2 1192

FEASIBILITY ANALYSIS

Comparisons of Some Large Scientific Computers.
N82-11817/5 1174

FEASIBILITY STUDIES

A Preliminary Examination of EDA Feasibility Studies.
PB82-126533 1091

FEDERAL ASSISTANCE PROGRAMS

Case Studies of the Impact of Federal Aid on Major Cities: City of Cleveland.
PB82-131558 1114

National Monthly Medicaid Statistics, April 1979.
PB82-135815 1132

Requests for Federal Disaster Assistance Need Better Evaluation.
PB82-139122 1115

Fair Market Rents (FMRs) for Existing Dwellings: An Evaluation Through Hedonic Index Methods,
PB82-144486 1116

Grantee Budgeting for Federal and State Aid, Part 1: General Findings and Policy Options,
PB82-144957 1094

Grantee Budgeting for Federal and State Aid, Part 2: Jurisdictional Practices,
PB82-144965 1094

FEDERAL BUDGETS

Progress in Improving Program and Budget Information for Congressional Use.
AD-A106 858/4 1088

The National Institute on Alcohol Abuse and Alcoholism Should Make Greater Efforts to Support Treatment Demonstration Projects.
AD-A107 194/3 1123

Office of Management and Budget Circular Number A-76 as a Statement of Federal Procurement Policy.
AD-A107 259/4 1089

FEDERAL GOVERNMENT

Federal Regulations, Statutes, and Reporting Requirements as Barriers to Efficient Medicaid Program Operations,
PB82-133711 1132

FEDERAL INFORMATION PROCESSING STANDARDS

Codes for Named Populated Places, Primary County Divisions, and Other Locational Entities of the United States (Fourth Update); FIPS PUB-55.
PB82-135146 1176

FEDERAL LAW

Examination of the Effectiveness of Statutory Offices of Inspector General.
AD-A107 187/7 1089

FEDERAL TRADE COMMISSION

Future Developments in the Food Industry and Their Implications for the Federal Trade Commission.
PB82-132366 1098

FEED MATERIALS PLANTS

Summary of the Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000816 1244

Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000817 1244

FEED SYSTEMS

Improved Constant-Output Atomizer.
PAT-APPL-6-308 203 1225

FEEDBACK CONTROL

Tuned Analog Network.
PAT-APPL-6-301 077 1179

Optimization of Stochastic Relay Control Systems by Means of Dimensional Analysis,
PB82-134610 1198

New Formulations for the Method of Inequalities,
PB82-135625 1199

FEEDERS

The Use of Self-Feeders in Fish Culture,
PB82-136425 1121

Electronically-Controlled Automatic Live-Food Feeder,
PB82-136656 1122

FEEDING STUFFS

Determination of Skimmed-Milk Powder in Feedingstuffs: Study of Some Interferences,
PB82-137852 1137

FEMALES

A Preliminary Study in Three Countries: Indonesia Report,
PB82-133232 1114

Women and Mortgage Credit: An Annotated Bibliography,
PB82-144387 1115

FERMENTATION

Future Developments in the Food Industry: Probable Emergence of Near Field Fermentation Conversion Centers.
PB82-132382 1099

FERROMAGNETISM

Low-Temperature Theories of the Classical One-Dimensional Easy-Plane Ferromagnet: Successes and Limitations,
PB82-131665 1263

Spin-Wave Damping in the Quantum Ising-Heisenberg Chain,
PB82-134149 1263

FERTILITY

Changing Patterns of Fertility: The Impact of Contraceptive Technology on a Maya Village.
PB82-131061 1131

FETAL ALCOHOL SNYDROME

Fetal Alcohol Syndrome. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859943 1135

FFTF REACTOR

FFTF MOTA: Design Thermal and Stress Overcheck Analyses.
DE81027367 1247

FIBER COMPOSITES

The Industrial Processing of Unidirectional Fiber Prepregs.
N82-11119/6 1191

Cryogenic Properties of Filamentary-Reinforced Composites: An Update.
PB82-133992 1191

Anisotropic Elastic Constants of a Fiber-Reinforced Boron-Aluminum Composite.
PB82-134016 1191

FIBER OPTICS

Model Analysis of the Raman Spectrum from Fused Silica Optical Fibers.
AD-A106 938/4 1148

Holographic Displacement Analysis with Multimode-Fiber Optics.
AD-A107 020/0 1230

Investigation of Combustion Process Using Fiber Optics.
AD-A107 029/1 1264

Development of an Electronic Interface for a Fiber Optic Interferometric Sensor.
AD-A107 261/0 1237

Optical Fiber Interferometer for the Study of Ultrasonic Waves in Composite Materials.
N82-11121/2 1191

Measurement of Optical Fiber Bandwidth in the Frequency Domain.
PB82-135179 1256

Connectors for Fiber Optics. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-859646 1257

FIBER ORIENTATION

The Industrial Processing of Unidirectional Fiber Prepregs.
N82-11119/6 1191

FIBER REINFORCED COMPOSITES

Radiation Testing of Composite Materials, in Situ Versus Ex Situ Effects.
N82-11116/2 1190

FIBERS

Theoretical Investigation of Absorptive Processes.
AD-A107 278/4 1253

Industrial Hygiene Survey Report at U.S. Gypsum Corporation, Birmingham, Alabama.
PB82-107194 1139

FIELD EFFECT TRANSISTORS

A 31-GHz Monolithic GaAs Mixer/Preamplifier Circuit for Receiver Applications.
AD-A107 062/2 1178

Integrated Balanced FETs for Broadband Millimeter Wave Amplifiers.
AD-A107 526/6 1171

Low Temperature Growth and Electrical Characterization of Insulators for GaAs MISFETS.
N82-11959/5 1171

FILARIASIS

Present Situation of Filariasis in China,
PB82-129651 1131

FILE MAINTENANCE

File Analysis and Selection Technique (FAST).
PB82-121815 1095

File Analysis and Selection Technique (FAST). Users Manual.
PB82-121823 1095

DSMS Update System.
PB82-121898 1095

DSMS Update System, User's Guide.
PB82-121906 1095

FILES (RECORDS)

Records Filing, Maintenance and Disposition Study for Department of the Army.
AD-A107 079/6 1094

Veterans Administration's Efforts to Improve the Management of Paper Records in the Department of Veterans Benefits. A Major System Acquisition Project.
AD-A107 192/7 1095

FILLERS

The Stability of New Transparent Polymeric Materials: The Epoxy Trimethoxyboroxine System. Part 1: The Preparation, Characterization and Curing of Epoxy Resins and Their Copolymers.
N82-11208/7 1195

FILMS

Preparation and Characterization of Neutral and Oxidized Polypyrrole Films.
AD-A107 166/1 1195

Hot-Wire and Hot-Film Anemometers.
AD-A107 213/1 1228

FINANCE

HUD Should Strengthen Mortgagee Monitoring to Reduce Losses.
AD-A107 283/4 1097

Finance Issues: County Highways and Public Transit,
PB82-128828 1091

Relevance to HUD of Recent Scholarly Research in Urban Economics,
PB82-144452 1101

FINANCIAL DATA

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ORNL/TM-6428 1090

FINANCIAL MANAGEMENT

New Initiatives in Financial Management Capacity Sharing: The Municipal Finance Officers' Perspective.
PB82-144585 1093

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PB82-144593 1217

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PB82-144924 1094

Management Improvement Needs of Local Manager Governments: A Final Report.
PB82-144981 1094

FINANCIAL STATEMENTS

Financial Profile of 15 New Agricultural Marketing Cooperatives,
PB82-131202 1080

FINANCING

Risk of Inner-City Mortgage Lending,

PB82-144627 1101

FINGERPRINTS
Results of Fingerprint Image Quality Experiments.
PB82-133539 1114

FINITE DIFFERENCE THEORY
High Solitary Waves in Water: A Refined Numerical Method.
AD-A107 041/6 1156

Some Observations on a New Numerical Method for Solving Navier-Stokes Equations.
N82-11032/1 1254

FINITE ELEMENT ANALYSIS
The Dynamic Design-Analysis Method (DDAM) in NASTRAN.
AD-A107 074/7 1262

A Two-Dimensional Finite Element Advection Model with Variable Resolution.
AD-A107 511/8 1086

Automatic Input Data Generation for ADINA and NASTRAN Structural Computer Codes.
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FINITE ELEMENT METHOD
SPAR Data Set Contents.
N82-11816/7 1273

FIRE DEPARTMENTS
Fire Department Participation in the Identification and Transportation of Victims of Thermal Injury 'In Central New York State' Exploratory Study.
PB82-106832 1130

FIRE FIGHTING
Firefighting Module Development.
N82-11311/9 1225

FIRE HAZARDS
The Activity Fuel Appraisal Process: Instructions and Examples.
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FIRE TESTS
Fire Endurance Under Design Load for Walls of One-Story Three-Room Structures of Sandwich and Wood-Frame Construction,
PB82-144601 1227

FIRES
Geohydrology of Bandelier National Monument, New Mexico.
LA-8461-MS 1160

FIRING TESTS (ORDNANCE)
Simulation Testing of Weapon Systems.
AD-A106 821/2 1251

FIRST WALL
Review of Melting and Evaporation of Fusion-Reactor First Walls.
DE81030035 1239

First Wall Magnetic Protection in an Inertially Confined Thermonuclear Reactor.
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FISCHER-TROPSCH SYNTHESIS
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FISH HATCHERIES
Corps of Engineers' Acquisition of Fish Hatchery Proves Costly.
AD-A106 828/7 1079

FISHERIES
Alaska OCS Socioeconomic Studies Program: St. George Basin and North Aleutian Shelf Commercial Fishing Industry Analysis.
PB82-139817 1122

FISHES
A Study of the Invertebrates and Fishes of Salt Marshes in Two Oregon Estuaries.
AD-A106 973/1 1155

Juvenile Salmonid and Baitfish Distribution, Abundance and Prey Resources in Selected Areas of Grays Harbor, Washington.
AD-A106 984/8 1155

Size and Sex Ratio of King Mackerel, 'Scomberomorus cavalla', in the Southeastern United States.
PB82-109406 1121

Acclimation Temperature: An Important Factor Influencing the Interaction of Chlorine, delta T and Exposure Duration to Eggs, Prolarvae and Larvae of Striped Bass, 'Morone saxatilis',
PB82-118894 1145

Effects of Pollution on Freshwater Fish.
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N82-11208/7 1195

FLAME STABILITY
An Investigation of Flame Stability in a Coaxial Dump Combustor.
AD-A107 256/0 1264

FLAMES
Burning Rate Maximum of a Plane Premixed Flame.
AD-A107 163/8 1264

An Investigation of Flame Stability in a Coaxial Dump Combustor.
AD-A107 256/0 1264

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LBL-9809 1209

FLAREOUT
Microwave Landing System Flare Subsystem Test.
AD-A107 327/9 1237

FLASH LAMPS
Active Lamp Pulse Driver Circuit.
PAT-APPL-6-276 748 1179

FLAT PLATE COLLECTORS
Reducing Conventive Losses from Cover Glazings of Solar-Thermal Collectors.
DE81025726 1200

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FLAVIVIRUSES
A Multidisciplinary Program of Infectious Disease Surveillance along the Transamazon Highway in Brazil: Epidemiology of Arbovirus Infections.
AD-A107 008/5 1123

FLEXIBLE BODIES
Parameter Estimation of Large Flexible Aerospace Structures with Application to the Control of the Maypole Deployable Reflector.
N82-11099/0 1272

FLEXIBLE PAVEMENTS
Flexible Pavement Overlay Design Procedures. Volume 1. Evaluation and Modification of the Design Methods.
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PB82-802794 1218

FLIGHT CHARACTERISTICS
The Effects of Lateral Aerodynamic Uncertainties on the Handling Qualities of the Space Shuttle Orbiter at Mach Numbers of 1.5 and .6.
N82-11051/1 1272

FLIGHT CONDITIONS
The Effects of Lateral Aerodynamic Uncertainties on the Handling Qualities of the Space Shuttle Orbiter at Mach Numbers of 1.5 and .6.
N82-11051/1 1272

Evaluation of Photogrammetric Flight under Icing Conditions on March 23, 1978.
N82-11725/0 1087

FLIGHT CONTROL SYSTEMS
Theory and Applications of Optimal Control in Aerospace Systems.
AD-A106 937/6 1078

AUTOPILOT: A Distributed Planner for Air Fleet Control.
AD-A107 139/8 1236

Digital Command Augmentation for Lateral-Directional Aircraft Dynamics.
AD-A107 264/4 1079

FLIGHT CREWS
Report of the President's Task Force on Aircraft Crew Complement,
AD-A106 889/9 1106

Training Improvements for the Tactical Aircrew Training System (TACTS): Project Summary Report.
AD-A107 003/6 1107

Development of a Computer Based Air Combat Maneuvering Range Debrief System. Volume I.
AD-A107 342/8 1108

FLIGHT INSTRUMENTS
AGARD Flight Test Instrumentation Series. Volume 13. Practical Aspects of Instrumentation System Installation,
AD-A107 355/0 1077

FLIGHT PATHS
AUTOPILOT: A Distributed Planner for Air Fleet Control.
AD-A107 139/8 1236

Algorithm for Fuel Conservative Horizontal Capture Trajectories.
N82-11018/0 1076

FLIGHT SIMULATORS
Preparation and Design for a Training Effectiveness Evaluation of Device 2F64C for Replacement Pilot Training,
AD-A106 939/2 1106

Computer Image Generation: Advanced Visual/Sensor Simulation.
AD-A107 098/6 1172

FLIGHT TESTING
AGARD Flight Test Instrumentation Series. Volume 13. Practical Aspects of Instrumentation System Installation,
AD-A107 355/0 1077

FLIGHT TRAINING
Preparation and Design for a Training Effectiveness Evaluation of Device 2F64C for Replacement Pilot Training,
AD-A106 939/2 1106

Conceptual Development of a Preliminary LSO Carrier Landing Training Aid.
AD-A107 002/8 1107

FLOOD FREQUENCY
Selected Hydrologic Relationships for Soldier Creek, Northeastern Kansas.
PB82-138751 1160

FLOODING
Floods on Big Creek in the Vicinity of La Follette, Tennessee.
PB82-128711 1211

Selected Hydrologic Relationships for Soldier Creek, Northeastern Kansas.
PB82-138751 1160

FLOODS
Terminating the Audit of the National Flood Insurance Program's Fiscal 1980 Financial Statements.
AD-A107 168/5 1089

Floods on Big Creek in the Vicinity of La Follette, Tennessee.
PB82-128711 1211

FLORIDA
Conversion of Municipal Solid Waste to Energy, Jacksonville, Florida, Phase I Report.
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PB82-136110 1160

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PB82-136128 1160

FLOTATION
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PB82-858739 1167

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PB82-858846 1193

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Flotation Separation of Copper Particles. 1966-1981 (Citations from the Metals Abstracts Data Base).
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PB82-859398 1194

Flotation Separation of Gold and Silver Particles. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859406 1194

FLOW CHARACTERISTICS
Analytical and Experimental Study of Flow Phenomena in Noncavitating Rocket Pump Inducers.
N82-11031/3 1270

Novel Improved PMR Polyimides.
N82-11117/0 1190

FLOW DISTORTION
Amplified Crossflow Disturbances in the Laminar Boundary Layer on Swept Wings with Suction.
N82-11391/1 1078

FLOW DISTRIBUTION
A Wake Source Model for Asymmetric Potential Flow past Bodies of Wedge Shape.
N82-11036/2 1254

A Wake Source Model for Non-Symmetric Flow past Bluff Bodies in Two-Dimensional Flow.
N82-11037/0 1076

Generation of Axi-Symmetric Body Shapes in Subsonic Flow by Means of Polynomial Distributions of Sources and Doublets Along the Axis of Symmetry.
N82-11038/8 1254

A Comparison of Theoretical and Experimental Pressure Distributions for Two Advanced Fighter Wings.
N82-11054/5 1078

FLOW EQUATIONS
Computation of High Reynolds Number Internal/External Flows.
N82-11046/1 1254

A Second-Order Accurate Procedure for Solving the Boundary Layer Equations Based on the Predictor-Corrector Form of the Crank-Nicolson Scheme.
N82-11826/6 1198

FLOW GEOMETRY
Higher-Level Simulations of Turbulent Flows.
N82-11395/2 1254

FLOW VISUALIZATION
Effects of Vortex Flaps on the Low-Speed Aerodynamic Characteristics of an Arrow Wing.
N82-11013/1 1077

FLOWMETERS
Experience with an Expendable Temperature and Velocity Profiler.
AD-A106 914/5 1156

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PB82-855768 1254

FLUE GAS
Thermodynamic Data for Flue-Gas Desulfurization Processes.
DE81030545 1150

FLUID DYNAMICS
The Von Karman Swirling Flows.
AD-A107 010/1 1253

Instability and Transition in Pipes and Channels.
AD-A107 211/5 1253

Vibrational Analysis in Aerodynamics. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
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Vibrational Analysis in Fluids. 1970-1981 (Citations from the Engineering Index Data Base).
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FLUID FLOW
Linearized Solution to Inlet Equation with Inertia.
AD-A107 205/7 1156

CONCHAS: An Arbitary Lagrangian-Eulerian Computer Code for Multicomponent Chemically Reactive Fluid Flow at All Speeds.
LA-8129-MS 1253

1/5-Scale Countercurrent Flow Data Presentation and Discussion.
NUREG/CR-2106 1248

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PB82-859034 1254

FLUIDIZED BED
Cocurrent Three-Phase Fluidized Bed. Part 2.
ORNL-MIT-213 1265

FLUIDIZED-BED COMBUSTORS
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ORNL/TM-6626/V1 1187

Fossil Energy Materials Needs Assessment.
ORNL/TM-7232 1193

FLUIDIZED BED PROCESSORS
Assessment of Advanced Coal Gasification Processes.
N82-11146/9 1147

Lewis Research Center's Coal-Fired, Pressurized, Fluidized-Bed Reactor Test Facility.
N82-11397/8 1265

FLUIDS
Propagation of Density Fluctuations in Nonuniform Fluids: Simple Models,
PB82-140591 1154

A Transient Hot Wire Thermal Conductivity Apparatus for Fluids,
PB82-140609 1229

FLUORESCENCE
Fluorescent Glasses for Use in Fluorescently Pumping Nd 3(+) Doped Laser Glass.
AD-A107 503/5 1255

Laser Induced Fluoroescence from Algae: Results of a Ship-Borne Field Test.
N82-11758/1 1121

FLUORESCENT ANTIBODY TECHNIC
A New Method for Determination of Anti-Double Strand DNA Antibodies, Trypanosoma Equiperdium Immunofluorescent Method,
PB82-129636 1131

Studies on the Rapid Detection of Dengue Virus Antigen by Immunofluorescence and Radioimmunoassay,
PB82-136052 1133

FLUORINE
Synthesis, Radiation Degradation, and Electron Beam Resist Behavior of Fluorine-Containing Vinyl Polymers.
AD-A106 913/7 1194

FLUTE INSTABILITY
Resistive G-Modes and Ballooning.
LA-UR-80-738 1261

FLUTTER
New Estimation Method for Flutter or Divergence Boundary from Random Responses at Subcritical Speeds.
N82-11034/7 1077

Vibrational Analysis in Aerodynamics. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
PB82-858531 1076

Vibrational Analysis in Aerodynamics. 1970-1981 (Citations from the Engineering Index Data Base).
PB82-858549 1076

Vibrational Analysis in Aerodynamics. 1970-1981 (Citations from the NTIS Data Base).
PB82-858556 1076

FLUTTER ANALYSIS
An Influence Coefficient Method for the Application of the Modal Technique to Wing Flutter Suppression of the Dast Arw-1 Wing.
N82-11070/1 1078

FLYING PLATFORMS
Parametric Study of Microwave-Powered High-Altitude Airplane Platforms Designed for Linear Flight.
N82-11050/3 1077

FOAM
Use of Foam to Reduce Gun Blast Noise Levels.
AD-A107 081/2 1251

FOAMS
Fracture Mechanics of Cellular Glass.
N82-11209/5 1189

FOCI
Focal Axis Resolver for Offset Reflector Antennas.
PAT-APPL-6-308 009 1179

FOG
Fog Prediction. 1964-November, 1981 (Citations from the NTIS Data Base).
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FOLDING STRUCTURES
Technology for Large Space Systems: A Special Bibliography.
N82-11093/3 1272

Standard Specification for Light Ladders.
N82-11277/2 1218

Study of Foldable Elastic Tubes for Large Space Structure Applications, Phase 3.
N82-11493/5 1273

FOOD
Grain Fumigation: A Multifaceted Issue Needing Coordinated Attention.
AD-A106 841/0 1079

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FOOD ANALYSIS
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FOOD CONSUMPTION
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AD-A107 307/1 1137

FOOD INDUSTRY
Evaporation by Mechanical Vapor Recompression. Technical Progress Report, April 1, 1980-June 30, 1980.
BSDF-38-3Q-80 1137

Future Developments in the Food Industry and Their Implications for the Federal Trade Commission.
PB82-132366 1098

Future Developments in the Food Industry: Probable Efforts at Vertical Integration by Food Retailers.
PB82-132374 1098

Future Developments in the Food Industry: Probable Emergence of Near Field Fermentation Conversion Centers.
PB82-132382 1099

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PB82-857186 1203

FOOD PRESERVATION
Storage Cost Data on CCC-Owned Dairy Commodities.
AD-A106 892/3 1137

FOOD PROCESSING
Evaluation of Low-Cost Extrusion Cooker in Sri Lanka.
PB82-133786 1137

Sun-Drying Methodology: Report of a Seminar, 21 May 1976.
PB82-136292 1137

Rice Bran and Rice Bran Oil: Food Processing. 1972-1981 (Citations from the Food Science and Technology Abstracts Data Base).
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PB82-858333 1138

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PB82-859331 1138

FOREIGN
Industry Views on the Ability of the U.S. Photovoltaics Industry to Compete in Foreign Markets.
AD-A106 881/6 1097

The United States Remains Unprepared for Oil Import Disruptions. Volume II. Detailed Review of Current Emergency Programs and Alternative Approaches.
AD-A106 922/8 1180

FOREIGN OWNERSHIP
State Laws Relating to the Ownership of U.S. Land by Aliens and Business Entities.
PB82-135211 1099

FOREIGN POLICY
U.S. Laws and Regulations Applicable to Imports from Nonmarket Economies Could be Improved.
AD-A106 878/2 1097

FOREIGN TECHNOLOGY
The British Sting Ray Torpedo: Information Should be Obtained to Determine Potential Benefits to U.S. Antisubmarine Warfare Programs.
AD-A106 896/4 1252

Theory and Applications of Optimal Control in Aerospace Systems,
AD-A106 937/6 1078

A True Air Speed Sensor for Miniature Unmanned Aircraft.
AD-A106 967/3 1079

The Design of a 'Jet Catcher'.
AD-A106 968/1 1253

Applications of the Microscan 9 Microanalyser.
AD-A106 969/9 1148

A Basic Computer Program to Calculate Moisture Content in Resins and Fibre Reinforced Resin Composites.
AD-A106 970/7 1194

A Technical Assessment of Aeronautical Engineering in Israel.
AD-A106 980/6 1075

Cutting Ice with High Pressure Water Jets--Translation.
AD-A106 985/5 1169

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The Fracture of Thermosetting Resins after Exposure to Water.
AD-A107 237/0 1195

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AD-A107 306/3 1255

Biophysics of Water: A Working Conference.
AD-A107 336/0 1120

AGARD Flight Test Instrumentation Series. Volume 13. Practical Aspects of Instrumentation System Installation,
AD-A107 355/0 1077

The Impact of New Guidance and Control Systems on Military Aircraft Cockpit Design.
AD-A107 356/8 1079

Third National Reliability Conference Birmingham, England.
AD-A107 449/1 1173

9th Scientific Meeting of the International Epidemiological Association.
AD-A107 471/5 1124

A 10.6 micrometer Amplitude Modulated Telemeter Laser with Nonlinear Postdetection: Study of a Single Laser System--Translation.
AD-A107 475/6 1256

Image Segmentation with Color and Texture,
AD-A107 479/8 1173

Microhardness, Friction and Wear of SiC and Si3N4 Materials as a Function of Load, Temperature and Environment.
AD-A107 501/9 1189

The Oxidation and Corrosion Resistance of Nitrided Iron Alloys.
AD-A107 516/7 1192

Environmental Failure of Adhesive Bonding in Composites.
AD-A107 538/1 1190

Laser-Matter Interaction.
AECL-6343 1260

Hydrogeological and Geochemical Studies in the Perch Lake Basin. A Second Report of Progress.
AECL-6404 1157

Evaluation of the Capture Cross Section of exp 169 Tm from 10 exp -5 EV to 2.10 exp 7 EV.
CEA-CONF-4469 1257

SPH Homogeneization Method.
CEA-CONF-4492 1249

Symposium on Power and Measurement Transformers.
CONF-7909201- 1171

Magnesium Hydroxide Neutron-Shielding Material and Method of Producing Such Material.
DE81030298 1242

Proton Spectra in High-Energy Pion-Nuclei Collisions Not Accompanied by Multiparticle Production.
JINR-E-1-11975 1258

Proton Multiplicity Distribution of High-Energy Pion-Nuclei Collisions.
JINR-E-1-11976 1258

Proton Multiplicity Distributions in High-Energy Hadron-Nuclei Collisions.
JINR-E-1-12088 1258

Comparison of Charged Particle Multiplicity Distributions in p Tilde p and Pp Interactions and Verification of the Dual Unitarization Scheme.
JINR-E-1-12306 1258

Strange-Particle Cross Sections from Four-Prong pi exp - p Interactions at 16 GeV/C.
JINR-E-1-12345 1258

Deep Inelastic Lepton-Nucleus Scattering.
JINR-E-2-12127 1258

OSp(1,4)-Superfields in Chiral Representation.
JINR-E-2-12364 1261

Special Relativistic Two-Body Problem. 1. Past.
JINR-E-2-12390 1261

Gravitational Axial Superfield and the Formalism of Differential Geometry.
JINR-E-2-12511 1261

Xi exp 0 Hyperon in the pi exp - p Interactions at 16 GeV/C.
JINR-R-1-11654 1258

Hyperfragment Production in Proton-Nucleus Interactions at 70 and 250 GeV.
JINR-R-1-12315 1258

Connection Between the Spin Magnetic Moment of an Electron and the Dirac Monopole.
JINR-R-2-11338 1261

Nucleus-Nucleus Interaction in the Glauber Approximation.
JINR-R-2-12079 1258

Hadron Production in Quark Combination with Colors.
JINR-R-2-12154 1258

Comparative Investigation of the Stability of One-Dimensional and Spherical Symmetric Solitons of the Scalar Field with Self-Interaction Jsub(Mu)Jsup(Mu).
JINR-R-2-12232 1261

Correlations of Identical Particles in the "Resonance + Particle" System.
JINR-R-2-12302 1258

Relativistic Quantum Mechanics of Scalar Field.
JINR-R-2-12395 1259

Investigation of the Problem of Massive Particle Capture by Quantum Scalar Field. Determination of the Effective Mass of the System.
JINR-R-2-12470 1259

Shape of Fast Rotating Heated Nuclei. Calculation Results.
JINR-R-4-12399 1259

Weak and Electromagnetic Characteristics of Pseudoscalar Mesons in the Nonlocal Quark Model.
JINR-R-4-12509 1259

JINR Synchrophasotron Operation and Improvement (The Second Quarter of 1978).
JINR-9-11990 1257

Realistic Nucleon-Nucleon Forces and the Structure of Atomic Nuclei.
Juel-Spez-39 1258

Simulation of the Chemical State of Irradiated Oxide Fuel; Influence of the Internal Corrosion on the Mechanical Properties of Zry-4 Tubing.
KFK-2785 1247

Real Time Program for Reactivity Calculations in Nuclear Reactors.
KFKI-1979-07 1249

Time Correlation in Two-Photon Decay.
KFKI-1979-78 1259

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Hadronic Cross Sections Study in E exp + E exp - Collisions from 1.350 GeV to 2.125 GeV.
LAL-78-32 1260

Review on Photon-Photon Collisions in Electron Storage Rings.
LPC-79-03 1260

Meson F sub 1 Spin and Parity Measurement.
LPNHEP-T-78-01 1260

A Study on Numerical Method for Evaluating Spanwise Integral in Subsonic Lifting-Surface Theory.
N82-11035/4 1076

A Wake Source Model for Asymmetric Potential Flow past Bodies of Wedge Shape.
N82-11036/2 1254

A Wake Source Model for Non-Symmetric Flow past Bluff Bodies in Two-Dimensional Flow.
N82-11037/0 1076

Generation of Axi-Symmetric Body Shapes in Subsonic Flow by Means of Polynomial Distributions of Sources and Doublets Along the Axis of Symmetry.
N82-11038/8 1254

New Molding Method of Three-Dimensional Hollow Photoelastic Model and Centrifugal Stress Analysis of Air Cooled Turbine Blade Model.
N82-11067/7 1270

The Industrial Processing of Unidirectional Fiber Prepregs.
N82-11119/6 1191

Silicon Carbide as an Oxidation-Resistant High-Temperature Material. 1: Oxidation and Heat Corrosion Behavior.
N82-11120/4 1189

The Storage of Hydrogen in the Form of Metal Hydrides: An Application to Thermal Engines.
N82-11225/1 1269

Standard Specification for Light Ladders.
N82-11277/2 1218

Standard Specification for Industrial Safety-Belt Assemblies.
N82-11278/0 1225

Design Methodology and Development History of an ISO OSI Layered Architecture for the Canadian Broadcast Telidon System.
N82-11337/4 1234

Application of a Rare-Earth Cobalt Magnet to Synchronous Motors.
N82-11358/0 1171

Standard Specification for Apparatus for gamma Radiography.
N82-11433/1 1228

Standard Specification for Air-Brake Reservoirs.
N82-11464/6 1220

Effects of Aircraft Noise on the Equilibrium of Airport Residents: Testing and Utilization of a New Methodology.
N82-11636/9 1112

Meridional Heat Transport at the Onset of Winter Stratospheric Warming.
N82-11697/1 1085

Evaluation of Photogrammetric Flight under Icing Conditions on March 23, 1978.
N82-11725/0 1087

Cyclic Nucleotides in Tissues During Long-Term Hypokinesia.
N82-11757/3 1144

Laser Induced Fluoroescence from Algae: Results of a Ship-Borne Field Test.
N82-11758/1 1121

Participation of the Hypophyseal-Adrenal Cortex System in Thrombin Clearance During Immobilization Stress.
N82-11760/7 1144

Effects of Curative Treatment Emphasizing Endurance Training on the Performance and Blood Pressure of Hypertensive and Normotensives.
N82-11771/4 1144

Theory of Drift Instabilities and the Associated Anomalous Transport.
N82-11924/9 1240

Least Squares Autoregressive (Maximum Entropy) Spectral Estimation for Fourier Spectroscopy and Its Application to the Electron Cyclotron Emission from Plasma.
N82-11925/6 1261

An Energy Integral and Variational Principle for Plasma Kinetic Modes.
N82-11926/4 1261

Charge Transfer in Collisions of Li-3(+) And Be-4(+) Ions with Atomic Hydrogen at Low Impact Energy.
N82-11927/2 1152

Oblique Propagation of Electron Thermal Modes Below the Electron Plasma Frequency Without Boundary Effects.
N82-11928/0 1261

Boosting Up of Neutral Beam Heating Power by Slowly Rising Toroidal Field.
N82-11929/8 1240

Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.
N82-11989/2 1103

Radiation Balances and the Solar Constant.
N82-12016/3 1085

Heat Storage in Ground Water. Part 1. Study of Ground Water Reservoirs.
NE-PROJ-2060591(Pt.1) 1188

Heat Storage in Ground Water. Part 2. Study of Distribution Systems.
NE-PROJ-2060591(Pt.2) 1188

Shape of Prompt Neutron Spectrum from exp 252 Cf Spontaneous Fission.
NIIAR-1(360) 1260

Photoemulsion Method Application for Investigation of Plasma Neutron Radiation.
NIIEFA-K-0357 1261

Distributive Cathodes in Duoplasmatron Ion Sources.
NIIEFA-P-D-0411 1257

Quantization of the Axial Current for the Massless Rarita-Schwinger Field.
NORDITA-78-19 1261

Solid-Fuel Cooking Stoves: Bibliography.
NP-1902593 1201

Energy-Resource Requirements of a Solar-Heating System.
NP-1902600 1201

Multivariable Control of a Milling Circuit at East Driefontein Gold Mine,
PB82-128729 1166

A New Method for Determination of Anti-Double Strand DNA Antibodies, Trypanosoma Equiperdium Immunofluorescent Method,
PB82-129636 1131

Present Situation of Filariasis in China,
PB82-129651 1131

A New Concept on the Natural Course of Hepatocellular Carcinoma,
PB82-129669 1131

Case of Hereditary (4;5) Translocation Discovered Prenatally,
PB82-129693 1131

Determination of Estrogen Receptor in Human Colon Cancer Tissue with Labeled Fluorescence Estradiol (Fluorescein Isothiocyanate),
PB82-129719 1131

Orthoplasty for Bile Duct Stricture at the Liver Hilum, A Preliminary Report of 5 Cases,
PB82-129727 1131

Initial Results of In Vitro Studies of Clavulanic Acid Synergism,
PB82-129735 1141

Changing Patterns of Fertility: The Impact of Contraceptive Technology on a Maya Village.
PB82-131061 1131

Assessment of the Public Health Sector in Honduras, 1975-1985.
PB82-131095 1131

Third Evaluation of the Thailand National Family Planning Program.
PB82-131491 1114

Low-Temperature Theories of the Classical One-Dimensional Easy-Plane Ferromagnet: Successes and Limitations,
PB82-131665 1263

Control Panels - Layout and Design,
PB82-132051 1222

Stochastic Approach to Study the Influence of Rate of Loading on Strength of Concrete,
PB82-132135 1219

Recommendations for Road Surface Dressing.
PB82-132630 1219

Collapse Analysis of Three Dimensional Assemblages of Eccentrically Stiffened Hot Rolled Steel Plates and Shallow Shells,
PB82-132697 1262

Concrete Mechanics. Part A. Theory and Experiments on the Mechanical Behaviour of Cracks in Plain and Reinforced Concrete Subjected to Shear Loading,
PB82-132705 1219

Concrete Mechanics. Part B. Numerical Modelling of Bond-Slip Behaviour,
PB82-132713 1219

Concrete Mechanics. Part C. Numerical Models for Reinforced Concrete Structures in Plane Stress,

PB82-132721 1219

Geometrical Non-Linearity in Collapse Analysis of Thick Shells, with Application to Tubular Steel Joints,
PB82-132929 1219

General Derivation of Hardening Formulas,
PB82-132937 1219

A Simplified Approach to Creep Buckling and Creep Instability of Steel-Concrete Columns,
PB82-132945 1219

Five Robust Indicators of Central Value,
PB82-133109 1198

The Direct Determination, by Differential Pulse Anodic-Stripping Voltammetry at the Thin Mercury-Film Electrode, of Cadmium, Lead, and Copper,
PB82-133125 1152

The Investigation of a Fracture on One Side of a Skip Bridle in a Mine Shaft,
PB82-133372 1166

Evaluation of Low-Cost Extrusion Cooker in Sri Lanka.
PB82-133786 1137

Spin-Wave Damping in the Quantum Ising-Heisenberg Chain,
PB82-134149 1263

Heat Energy Recovery from Domestic Output Fluids (HERDOF),
PB82-134156 1188

COMPUMAG: Papers Presented by Members of the Laboratory at the Conference of the Computation of Electromagnetic Field, Chicago, 14-17 September, 1981,
PB82-134164 1253

Recursive System Identification Using Fast Algorithms,
PB82-134578 1198

Optimization of Stochastic Relay Control Systems by Means of Dimensional Analysis,
PB82-134610 1198

A Review of Numerical Methods for the Analysis and Design of Soft Ground Tunnels,
PB82-134628 1213

HOMEP - An Algorithm for Analysing Homogeneous Stress/Strain Histories,
PB82-134644 1170

Control of Building Engineering Services. Part 1: Background,
PB82-134669 1092

Control of Building Engineering Services. Part 2: A Survey of Proprietary Automation Systems,
PB82-134677 1092

Control of Building Engineering Services. Part 3: A Proposal for a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134685 1092

Control of Building Engineering Services. Part 4: Hardware Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134693 1092

Control of Building Engineering Services. Part 5: Software Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134701 1092

Control of Building Engineering Services. Part 6: Survey of the Control Systems Centre's Building Engineering Services,
PB82-134719 1092

On-Lining an SDK-85 Microcomputer with a DEC System 10 for Down-Line Loading of Microcomputer Programs,
PB82-134776 1176

Interactive Maximum Likelihood Estimation,
PB82-134784 1198

Computation of Abscissa of Stability by Repeated Use of the Routh Test,
PB82-134800 1199

Kielder Aqueduct Tunnels - Predicted and Actual Geology,
PB82-135302 1214

Determining Optimum Routes from Maps,
PB82-135310 1214

Yellow Bar Experimental Carriageway Markings - Accident Study,
PB82-135328 1225

Site Investigation and Construction of the Cardiff Cable Tunnel,
PB82-135336 1214

Reproducibility of Joint Spacing Measurements in Rock,
PB82-135344 1159

Surface Dressing in Developing Countries: Research in Kenya,
PB82-135351 1220

Probabilistic Analysis of Seismic Response of Multi-Supported Structures on Soft Soils (Analisis Probabilistico de la Respuesta Sismica de Estructuras Sobre Varios Apoyos en Suelos Blandos),
PB82-135377 1226

Design of Concrete Walls with Shear Failure (Diseno de Muros de Concreto Con Falla Por Cortante),
PB82-135385 1226

Trusted Interval in the Fourier Spectra of Accelerograms Digitized Either Manually or by Semi-Automatic Means (Intervalo Confiable en el Espectro de Fourier Obtenido de Acelerogramas Digitizados Manualmente o Con Medios Semiautomaticos),
PB82-135393 1169

Static Penetrometer for Soft and Loose Soils (Penetrometro Estatico Para Suelos Blandos Y Sueltos),
PB82-135401 1170

Non-Contacting Suspension and Propulsion Systems for Transportation Applications,
PB82-135591 1221

New Formulations for the Method of Inequalities,
PB82-135625 1199

Design Concepts for a Hierarchical Two Dimensional Multiprocessor Structure,
PB82-135633 1176

SYCOL: Informal Language Specification,
PB82-135658 1176

SYCOL: A High Level Language for Applications in Real Time Control Systems,
PB82-135666 1176

Multivariable Pole Assignment Self Tuning Regulators,
PB82-135674 1199

On the Behaviour of Dynamical Systems Subject to Bounded Disturbances,
PB82-135682 1199

Transverse Properties of Hadrons Produced in Neutrino-Nucleon Scattering in BEBC,
PB82-135732 1260

A Study of the (26)Mg((12)C,(12)B)(26)Al Charge Exchange Reaction,
PB82-135740 1260

The Role of an Understanding of Social Factors in Forecasting Car Ownership,
PB82-135773 1221

Compensation of the Speed Governor of a Water Turbine by the Method of Inequalities,
PB82-136011 1224

Chinese Medical Journal. Volume 94, Number 10, October 1981.
PB82-136029 1132

Clinical Analysis of 120 Cases of Primary Amenorrhea,
PB82-136037 1133

Influence of Late-Pregnancy Toxemia on the Fetus,
PB82-136045 1133

Studies on the Rapid Detection of Dengue Virus Antigen by Immunofluorescence and Radioimmunoassay,
PB82-136052 1133

A New Concept on Chiasmal Architecture and Its Projection on the Retina,
PB82-136060 1133

Simulation of a Two-Dimensional Multiprocessor Structure,
PB82-136953 1177

A Two-Dimensional Study of the Maximum Power That Can Be Obtained from a Wind Turbine in a Wind Shear Layer,
PB82-136987 1187

Housing Demand Models and Housing Market Models for Regional and Local Planning,
PB82-137027 1114

Right Combination of Measures in the Right Building at the Right Time: Energy Conservation in the Form of Combinations of Measures.
PB82-137035 1202

Development of a Directly-Fired Heat Pump for Domestic and Light Commercial Application.
PB82-137191 1202

Thermal Energy Storage Systems. Part I.
PB82-137589 1188

Direct Detection of Hydrocarbons Using Seismic Procedures--Translation.
PB82-137597 1238

The Certification of Polycyclic Aromatic Hydrocarbon Materials (PAH). Part II: The Six Methylchrysene Isomers (BRC Reference Materials No. 77, 78, 79, 80, 81 and 82),
PB82-138355 1153

Analysis of Complete Logical Structures in System Reliability Assessment,
PB82-138363 1242

RSM Development for Nuclear Safety Analysis. A Test Problem,
PB82-138389 1242

The Dutch Geologic Radioactive Waste Disposal Project.
PB82-138397 1245

Description and Performance of an Active Solar Cooling System, Using a LiBr-H2O Absorption Machine,
PB82-139031 1202

Acoustic Model Power Distribution in a Duct at High Frequencies.
PB82-139064 1229

Improvements to Asbestos Diaphragms and Prospects for Their Replacement (Verbesserung von Asbest-Diaphragmen und deren eventueller Ersatz).
PB82-139445 1154

Hybrid Processes for the Production of Hydrogen (Hybridprozesse zur Wasserstofferzeugung).
PB82-139452 1269

Experimental Study of the Combustion of Low-Grade Calorific Material with the Aim of Assessing its Utility Value (Etude Experimentale de la Combustion Des Matieres a Faible Pouvoir Calorifique en Vue de Leur Valorisation).
PB82-139460 1269

Theoretical Study of the Process of Unimolecular Dissociation of Radicals (Etude Theorique des Processus de Dissociation Unimoleculaire des Radicaux),
PB82-139866 1154

Coal Transportation: An Analysis of Cost and Energy Requirements (Sicherheitsaspekte einer Kuenftigen Europaeischen Wasserstoff-Technologie).
PB82-140104 1167

Feasibility of the Connection of Wells in Hot Dry Rocks by Means of Hydraulic Fracturing Techniques: Experimental Research Dealing with Three-Dimensional Crack Interaction, Largely Utilizing Photoelastic Techniques.
PB82-140138 1167

Heat Recovery Installations with Reflux Heat Pipes as Basic Components (Waermerueckgewinnungsanlagen mit Reflux-Waermerohren als Bauelemente).
PB82-140146 1202

Biotechnology in Agricultural Research (Biotechnologie in het Landbouwkundig Onderzoek).
PB82-140450 1134

FOREIGN TRADE

Business America - The Magazine of International Trade, Volume 4, Number 25, December 14, 1981.
PB82-137498 1100

FOREST LAND

Trends in Recreational Use of National Forest Wilderness.
PB82-134297 1114

FORESTRY

The Activity Fuel Appraisal Process: Instructions and Examples.
PB82-107319 1081

Forest Policy Project Module III-A: Timber Supply Analysis and Baseline Simulations.
PB82-107509 1081

Forest Policy Project Module IV A: Socioeconomic Impact Assessment and Module IV B: Environmental Impact Assessment.
PB82-108085 1081

Alternative Forest Policies for the Pacific Northwest: Study Module V.
PB82-109125 1082

Biomass in Southeastern Forests.
PB82-133422 1082

A Wooden Energy Demonstration Center in Alabama. Phase I: A Background Investigation.
PB82-134271 1082

Oak Management in California.
PB82-134453 1082

FORESTS

Nationwide Forestry Applications Program. Analysis of Forest Classification Accuracy.
N81-29499/3 1081

FORMALDEHYDE

Formaldehyde: Electronic Structure Calculations for the S(0) and T(1) States.
AD-A107 016/8 1148

Men's Apparel Industrywide Study at Gant Shirtmakers Division of Consolidated Foods, Salisbury, MD.
PB82-107186 1139

Evaluation of Formaldehyde Problems in Residential Mobile Homes.
PB82-144619 1136

FORMULARIES

Deviance Within a Model of Superior Formulary Performance.
PB82-134420 1141

FORTIFICATIONS

Survivability--The Effort and the Payoff.
AD-A107 108/3 1230

FORTRAN

BKY Programming Systems Bulletin No. 1. Guidelines for Converting FTN4 Programs to FTN5 and the New FORTRAN-77 Standard. First Edition.
LBL-10189/1 1174

FOSSIL-FUEL POWER PLANTS

Comparative Cost Estimates of Five Coal Utilization Processes.
ORNL/Sub-7384/1 1209

FOSSIL FUELS

Unresolved Issues Remain Concerning U.S. Participation in the International Energy Agency.
AD-A106 879/0 1102

FOUNDATIONS

Seismic Isolation of an Electron Microscope.
LBL-10386 1226

FOUNDRIES

Potential Impediment of Foundry Capacity Relative to National Defense Needs.
AD-A106 885/7 1097

KEYWORD INDEX

FOURIER ANALYSIS
Modal Analysis Using a Fourier Analyzer, Curve-Fitting, and Modal Tuning.
N82-11490/1 1262

FOURIER SERIES
Circular and Extended Circular Harmonic Transforms and Their Relevance to Image Reconstruction from Line Integrals.
AD-A107 050/7 1196

FOURIER TRANSFORMATION
A New Algorithm for Two-Dimensional Maximum Entropy Power Spectrum Estimation.
AD-A107 123/2 1178

Least Squares Autoregressive (Maximum Entropy) Spectral Estimation for Fourier Spectroscopy and Its Application to the Electron Cyclotron Emission from Plasma.
N82-11925/6 1261

FRACTIONATION
Fractionation of Diesel Fuel from Petroleum and Paraho Shale Oils.
AD-A107 042/4 1266

FRACTURE (MECHANICS)
Dynamic J sub I-R Curve Testing of HY-130 Steel.
AD-A107 040/8 1191

A Fracture Limit Diagram for Determining Hydrogen Embrittlement of Sheet under Multiaxial Loading Conditions.
AD-A107 116/6 1191

The Fracture of Thermosetting Resins after Exposure to Water.
AD-A107 237/0 1195

Brittle Materials Design, High Temperature Gas Turbine.
AD-A107 522/5 1189

Environmental Failure of Adhesive Bonding in Composites.
AD-A107 538/1 1190

Fracture Mechanics of Cellular Glass.
N82-11209/5 1189

FRACTURING
Feasibility of the Connection of Wells in Hot Dry Rocks by Means of Hydraulic Fracturing Techniques: Experimental Research Dealing with Three-Dimensional Crack Interaction, Largely Utilizing Photoelastic Techniques.
PB82-140138 1167

FRAGMENTATION WARHEADS
Process for Fragment Layup, Filler Application, and Outer Coating for PATRIOT GM Warhead M248.
AD-A107 536/5 1232

FREE RADICALS
Time-Resolved Infrared Study of Bimolecular Reactions between Tert-Butly Radicals.
AD-A107 154/7 1148

FREE REPLACEMENT WARRANTY
Applications of Renewal Theory in Analysis of the Free-Replacement Warranty.
AD-A107 086/1 1089

FREEZING
Evaluation of Photogrammetric Flight under Icing Conditions on March 23, 1978.
N82-11725/0 1087

FREQUENCY ANALYZERS
Automatic Microwave Network Analyzer Calibration by Reference to a Transmission-Line Standard with Applications to Characterization of Adapters, Devices, and Coaxial Lines with SMA Connectors.
AD-A107 198/4 1227

FREQUENCY SYNTHESIZERS
Surface Acoustic Wave Microwave Oscillator and Frequency Synthesizer.
AD-A107 539/9 1178

FRESH WATER
Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume I,
PB82-131426 1211

Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume II,
PB82-131434 1211

FRESH WATER FISHES
Effects of Pollution on Freshwater Fish.
PB82-127358 1136

Intensive Culture of Walleye ('Stizostedion vitreum vitreum'),
PB82-136391 1121

FRESNEL REFLECTORS
Secondary and Compound Concentrators for Parabolic Dish Solar Thermal Power Systems.
N82-11550/2 1182

FUEL ASSEMBLIES
Engineering Design Study.
DE81025940 1246

FUEL CELLS
Development of Fuel Cell Gas Detection Instruments for Use in a Mine Atmosphere.
PB82-137316 1229

Fuel Cells, 1979-June, 1980 (Citations from the NTIS Data Base).
PB82-802828 1187

Fuel Cells, 1980-November, 1981 (Citations from the NTIS Data Base).
PB82-802836 1187

FUEL-CLADDING INTERACTIONS
Simulation of the Chemical State of Irradiated Oxide Fuel; Influence of the Internal Corrosion on the Mechanical Properties of Zry-4 Tubing.
KFK-2785 1247

FUEL CONSERVATION
Symposium on Commercial Aviation Energy Conservation Strategies, April 2-3, 1981. Papers and Presentations.
AD-A107 106/7 1181

FUEL CONSUMPTION
Consumers Need More Reliable Automobile Fuel Economy Data.
AD-A106 833/7 1179

Algorithm for Fuel Conservative Horizontal Capture Trajectories.
N82-11018/0 1076

Evaluation of the Micro-Carburetor.
N82-11994/2 1271

Use of Fuel Oil by Stationary Sources in California.
PB82-124405 1183

Urban Transportation Energy Accounts. Volume I - Procedures. Volume II - Case Study of the Chicago Region.
PB82-135542 1183

FUEL CYCLE
Fuel Utilization Improvements in a Once-Through PWR Fuel Cycle. Final Report on Task 6.
ORNL/SUB-7494/3 1248

Interim Assessment of the Denatured exp 233 U Fuel Cycle: Feasibility and Nonproliferation Characteristics.
ORNL-5398(Exec.Sum.) 1248

FUEL GAS
Design, Construction, and Operation of a Full Scale Experimental Anaerobic Fermentation Facility. Final Report.
DE81029028 1266

Fixed-Bed Gasification.
DE82000432 1146

Princetown I Data Analysis.
MLM-2731(OP) 1268

ORNL Coal Chemistry Report, 1979. Executive Summary.
ORNL-5629 1138

FUEL MANAGEMENT
Fuel Utilization Improvements in a Once-Through PWR Fuel Cycle. Final Report on Task 6.
ORNL/SUB-7494/3 1248

FUEL OIL
The Oil Shale Corporation Loan Guarantee Contract.
AD-A106 887/3 1180

FUEL PARTICLES
Partial Thermal Denitration of Uranyl Nitrate Solutions in a Screw Denitrator.
ORNL/TM-6264 1249

FUEL PINS
Data Acquisition and Control for gamma Scanning.
LA-UR-80-1358 1241

FUEL REPROCESSING PLANTS
In-Process Inventory Estimation for Pulsed Columns and Mixer-Settlers.
LA-UR-80-741 1248

Materials Management in an Internationally Safeguarded Fuels Reprocessing Plant.
LA-8042(V.1) 1248

Materials Management in an Internationally Safeguarded Fuels Reprocessing Plant.
LA-8042(V.3) 1249

FUEL RODS
Planning Support Document for the EPRI Light-Water-Reactor Fuel-Rod-Performance Program.
DE82900104 1248

FUEL SHORTAGES
Transportation Contingency Plans for Future Gas Shortages will not Meet Commuter Needs.
AD-A106 826/1 1179

FUEL SLURRIES
Fossil Energy Program. Quarterly Progress Report for the Period Ending June 30, 1981.
DE82000505 1268

FUEL SYSTEMS
Firefighting Module Development.
N82-11311/9 1225

FUELS
Energy Impacted Area Development Assistance Program's Designation Criteria.
AD-A106 902/0 1180

Geothermal Potential on Kirtland Air Force Base Lands, Bernalillo County, New Mexico.
AD-A107 044/0 1157

Overview of Considerations in Assessing the Biomass Potential of Army Installations.
AD-A107 132/3 1266

Statistical Research on Problems Associated with Navy Fire Protection and Fuel Technology Programs.
AD-A107 282/6 1225

Current Status of EPA Office of Mobile Source Air Pollution Control Characterization Projects: Summary.
PB82-105909 1269

Biomass in Southeastern Forests.
PB82-133422 1082

A Wooden Energy Demonstration Center in Alabama. Phase I: A Background Investigation.
PB82-134271 1082

Sludge Composting and Utilization: Rational Approach to Process Control.
PB82-136243 1269

Experimental Study of the Combustion of Low-Grade Calorific Material with the Aim of Assessing its Utility Value (Etude Experimentale de la Combustion Des Matieres a Faible Pouvoir Calorifique en Vue de Leur Valorisation).
PB82-139460 1269

FUMIGANTS
Grain Fumigation: A Multifaceted Issue Needing Coordinated Attention.
AD-A106 841/0 1079

FUNGI
Ethanol Production Via Fungal Decomposition and Fermentation of Biomass. Phase II. Semiannual Progress Report, October 1980-March 1981.
DE82000104 1267

FURLABLE ANTENNAS
Parameter Estimation of Large Flexible Aerospace Structures with Application to the Control of the Maypole Deployable Reflector.
N82-11099/0 1272

FURNACES
Space Processing of Electronic Materials.
N82-11094/1 1222

FURS (FIELD UNIT READINESS STUDY)
Field Unit Readiness Study (FURS).
AD-A107 469/9 1109

FUSARIUM
Ethanol Production Via Fungal Decomposition and Fermentation of Biomass. Phase II. Semiannual Progress Report, October 1980-March 1981.
DE82000104 1267

FUSED SILICA
Model Analysis of the Raman Spectrum from Fused Silica Optical Fibers.
AD-A106 938/4 1148

Ultra-Lightweight Mirror Manufacturing and Radiation Response Study.
AD-A106 996/8 1222

FUSELAGES
Wind Tunnel Tests of Elevon Gap Heating on the Space Shuttle Orbiter (OH-107).
AD-A107 287/5 1272

GALLIUM ARSENIDE LASERS
InGaAsP/InP Laser Development for Single-Mode, High-Data-Rate Communications.
N82-11452/1 1255

GALLIUM ARSENIDES
Trap Studies on GaAs-Si3N4 Interfaces.
AD-A106 990/5 1263

Properties of High-Efficiency X-Band GaAs Impatt Diodes.
AD-A107 043/2 1170

Vapor-Phase Epitaxy of GaInAsP and InP.
AD-A107 053/1 1252

GaAs Shallow-Homojunction Solar Cells on Ge-Coated Si Substrates.
AD-A107 056/4 1184

A 31-GHz Monolithic GaAs Mixer/Preamplifier Circuit for Receiver Applications.
AD-A107 062/2 1178

Molecular Beam Epitaxy of Ge-GaAs Superlattices.
AD-A107 157/0 1252

Liquid-Phase Epitaxial Growth of InP and InGaAsP Alloys.
AD-A107 233/9 1252

Preparation of Large-Diameter GaAs Crystals.
AD-A107 395/6 1252

Low Temperature Growth and Electrical Characterization of Insulators for GaAs MISFETS.
N82-11959/5 1171

GAME THEORY
Annual Progress Report.
AD-A106 983/0 1196

On the Optimal Solution of the One-Armed Bandit Adaptive Control Problem.
AD-A107 018/4 1196

Value Theory without Efficiency.
AD-A107 085/3 1199

GAMMA DETECTION
Directional gamma Detector.
PATENT-4 259 575 1241

GAMMA FUEL SCANNING
Data Acquisition and Control for gamma Scanning.
LA-UR-80-1358 1241

GAMMA RAYS
Evaluation of Gamma Radiation for Destruction of Pentachlorophenol in Aqueous Solution and on Activated Carbon.
AD-A106 943/4 1154

Standard Specification for Apparatus for gamma Radiography.
N82-11433/1 1228

Real-Time 3D X-Ray and gamma-Ray Viewer.
PAT-APPL-6-267 178 1179

The Graphite Calorimeter as a Standard of Absorbed Dose for Cobalt-60 Gamma Radiation,
PB82-140617 1241

GAMMARUS MINUS

Report of an Amphipod Species New to Ohio: 'Gammarus minus' Say (Amphipoda: Gammaridae).
PB82-132457 1121

GAS ANALYSIS

Chloroacetaldehyde (Analytical Method S11).
PB82-107244 1140

GAS CHROMATOGRAPHY

Performance Tests for the Evaluation of Computerized Gas Chromatography/Mass Spectrometry Equipment and Laboratories,
PB82-137662 1229

GAS COMPOSITION

Far-Infrared Measurements of Trace Gases.
N82-11698/9 1228

GAS DETECTORS

Development of Fuel Cell Gas Detection Instruments for Use in a Mine Atmosphere.
PB82-137316 1229

GAS PIPELINES

Regional Pipeline Environmental Assessment Record: An Aggregate Analysis of Major Areas of Pipeline Concern and Impact on the Outer Continental Shelf (Gulf of Mexico).
PB82-131301 1211

GAS STREAMS

Gas Levitator and Method for Containerless Processing.
PAT-APPL-6-297 486 1224

GAS TURBINE ENGINES

Marine Gas Turbine Engines. 1973-1981 (Citations from Information Services in Mechanical Engineering Data Base).
PB82-859893 1224

GAS TURBINES

Depot Support of Gas Turbine Engines.
AD-A107 141/4 1230

Investigation and Research of Specific Combustion-Turbine and Combined-Cycle Field Problems. Annual Report.
DE81904231 1270

Trends in High Temperature Gas Turbine Materials.
N82-11182/4 1193

Summary of the Research and Development Effort on Open-Cycle Coal-Fired Gas Turbines.
ORNL/TM-6253 1270

Assessment of an Atmospheric Fluidized-Bed Coal-Combustion Gas-Turbine Cogeneration System for Industrial Application.
ORNL/TM-6626/V1 1187

Acoustic Model Power Distribution in a Duct at High Frequencies.
PB82-139064 1229

GASES

The Drift, Diffusion, and Reactions of Slow Ions in Gases - O. N. R. Summary Questionnaire.
AD-A107 129/9 1148

Partitioning of Major, Minor, and Trace Elements During Simulated in-Situ Oil Shale Retorting.
LBL-9062 1151

High Voltage Research (Breakdown Strengths of Gaseous and Liquid Insulators) and Environmental Effects of Dielectric Gases. Semiannual Report, October 1, 1979-March 31, 1980.
ORNL/TM-7405 1152

GASOLINE

Effects of Alcohol Fuels on Engine Wear.
AD-A107 136/4 1266

GAUSSIAN NOISE

The Use of Output Moments to Predict Performance of Nonlinear Systems with Gaussian Inputs.
AD-A106 905/3 1178

GCFR REACTOR

Reactor Technology. Progress Report, January-March 1980.
LA-8403-PR 1247

GCFR TYPE REACTORS

Engineering Design Study.
DE81025940 1246

GE SEMICONDUCTOR DETECTORS

Calculated Response of Intrinsic Germanium Detectors to Narrow Beams of Photons with Energies Up to Approximately 300 keV.
PB82-137449 1241

GENERAL AVIATION AIRCRAFT

General Aviation Aircraft Antennas for the Global Positioning System.
N82-11339/0 1237

GENERATING FUNCTIONS

New Generating Functions and Results for the Density Polynomials of the Lattice Gas.
PB82-137365 1263

GENERATOR-COORDINATE METHOD

Realistic Nucleon-Nucleon Forces and the Structure of Atomic Nuclei.
Juel-Spez-39 1258

GENES

Radiation and Biophysical Studies on Cells and Viruses. Progress Report, September 1, 1979-June 15, 1980.
ORO-2832-213 1143

GEOACOUSTICS

Geoacoustic Modeling of Deep-Sea Carbonate Sediments,
AD-A107 028/3 1168

GEOCHRONOLOGY

Workshop on Early Crustal Genesis: Implications from Earth.
N82-11691/4 1158

GEODESY

Hotspots, Polar Wander, Mesozoic Convection and the Geoid.
N82-11694/8 1158

GEOGRAPHIC AREAS

Energy Impacted Area Development Assistance Program's Designation Criteria.
AD-A106 902/0 1180

Codes for Named Populated Places, Primary County Divisions, and Other Locational Entities of the United States (Fourth Update); FIPS PUB-55.
PB82-135146 1176

GEOIDS

Hotspots, Polar Wander, Mesozoic Convection and the Geoid.
N82-11694/8 1158

GEOLOGIC FORMATION

Recent Geologic History of a Barrier Island.
AD-A107 497/0 1157

GEOLOGIC FORMATIONS

Review of Current Capabilities for the Measurement of Stress, Displacement, and in Situ Deformation Modulus.
ONWI-95 1158

GEOLOGIC STRUCTURES

Regional Tectonics and Seismicity of Eastern Nebraska.
NUREG/CR-2411 1168

GEOLOGICAL FAULTS

Crustal Deformation and Seismic Measurements in the Region of Mcdonald Observatory, West Texas.
N82-11695/5 1169

GEOLOGICAL SURVEYS

Remote Sensing Applied to Geology and Mineralogy. 1973-November, 1981 (Citations from the NTIS Data Base).
PB82-802570 1159

GEOLOGY

Hotspots, Polar Wander, Mesozoic Convection and the Geoid.
N82-11694/8 1158

GEOMAGNETISM

Magnetic Field Satellite (MAGSAT) Data Processing System Specifications.
N82-11103/0 1174

Geomagnetic Observations.
N82-11693/0 1085

GEOTHERMAL ENERGY

Proceedings of the Geothermal Symposium: Potential, Legal Issues, Economics, Financing.
DE81023998 1161

Feasibility of the Connection of Wells in Hot Dry Rocks by Means of Hydraulic Fracturing Techniques: Experimental Research Dealing with Three-Dimensional Crack Interaction, Largely Utilizing Photoelastic Techniques.
PB82-140138 1167

GEOTHERMAL FIELDS

Case Study Data Base Companion Report 3 to Simulation of Geothermal Subsidence (LBL-10571).
LBL-10839 1166

GEOTHERMAL HEATING SYSTEMS

Utilization of Geothermal Energy in the Mining and Processing of Tungsten Ore. 2ND Quarterly Report.
DOE/ET/27232-T4 1162

GEOTHERMAL RESOURCES

Alaska: A Guide to Geothermal Energy Development.
DOE/ET/28476-T2 1162

BIGMAC: Basic Interactive Geothermal Model with Aquifer Characterization; A User's Guide,
PB82-128679 1183

Terrestrial Heat Sources for Geothermal Energy. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
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GEOTHERMAL SPACE HEATING

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JHU/APL-QM-80-101 1201

GEOTHERMAL WELLS

Directional Drilling Equipment and Techniques for Deep Hot Granite Wells.
LA-UR-80-2086 1165

Atlantic Coastal Plain Geothermal Test Holes, North Carolina, Hole Completion Reports.
NVO-1558-5(V.2) 1166

GEOTHERMY

Elimination of Federal Funds for the Heber Project will Impede Full Development and Use of Hydrothermal Resources.
AD-A106 916/0 1180

Geothermal Potential on Kirtland Air Force Base Lands, Bernalillo County, New Mexico.
AD-A107 044/0 1157

GERMANIUM

Molecular Beam Epitaxy of Ge-GaAs Superlattices.
AD-A107 157/0 1252

GERMANIUM ALLOYS

LASL Nb sub 3 Ge Conductor Development. Fifteenth Quarterly Progress Report, January 1-March 31, 1980.
LA-8446-PR 1263

GERT

Methods for Presentation and Display of Multivariate Data.
N82-11833/2 1198

GEYSERS GEOTHERMAL FIELD

Case Study Data Base Companion Report 3 to Simulation of Geothermal Subsidence (LBL-10571).
LBL-10839 1166

GLACIERS

USCGC GLACIER 1976 and 1978 Cruises. Rose Sea, Antarctica Sediment Descriptions,
PB82-134503 1159

GLASS

Vibrational Spectra of Oxygen- and Boron-Isotopically Substituted B2O3 Glasses.
AD-A107 333/7 1189

Fluorescent Glasses for Use in Fluorescently Pumping Nd 3(+) Doped Laser Glass.
AD-A107 503/5 1255

Survey of Matrix Materials for Solidified Radioactive High-Level Waste.
DE82000708 1244

Fracture Mechanics of Cellular Glass.
N82-11209/5 1189

GLASS COATINGS

High Temperature Glass Thermal Control Structure and Coating.
PAT-APPL-6-308 007 1190

GLASS FIBER REINFORCED PLASTICS

Fabrication and Wear Test of a Continuous Fiber/Particulate Composite Total Surface Hip Replacement.
N82-11211/1 1140

GLASS FIBERS

Predicting Failure of Optical Glass Fibers.
AD-A107 245/3 1189

GLASS INDUSTRY

Materials Analyses of Ceramics for Glass Furnace Recuperators.
ORNL/TM-6970 1190

GLASS LASERS

The Development of a High Average Power Glass Laser Source.
AD-A107 527/4 1255

GLASS REINFORCED PLASTICS

Engineering Design Handbook. Discontinuous Fiberglass Reinforced Thermoplastics.
AD-A106 942/6 1194

GLAUBER SALT

Thermal Energy Storage: Glauber's Salt. 1976-1981 (Citations from the Energy Data Base).
PB82-859091 1189

GLOBAL ATMOSPHERIC RESEARCH PROGRAM

SMMR Data Set Development for GARP.
N82-11512/2 1085

GLOBAL POSITIONING SYSTEM

General Aviation Aircraft Antennas for the Global Positioning System.
N82-11339/0 1237

GLUE

Cold Setting Glue for Packaging. 1976-1981 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
PB82-859836 1189

GLYCOPROTEINS

Trypanosoma rhodesiense: Chemical and Immunological Characterization of Variant-Specific Surface Coat Glycoproteins.
AD-A106 961/6 1123

GOES SATELLITES

Characteristics, of Tiros, Goes, Dmsp and Landsat Systems.
N81-29506/5 1272

GOLD

Flotation Separation of Gold and Silver Particles. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859406 1194

GOLD IONS
Search for Promethium-Like Gold Lines and Other Transitions of Interest to Fusion Research.
DE81029917 1239

GOVERNMENT EMPLOYEES
Serious Problems Need to be Corrected before Federal Merit Pay Goes into Effect.
AD-A106 843/6 1105

Alternatives to the Current Method of Computing General Schedule Pay.
AD-A107 178/6 1107

Obstacles Hamper the Office of Personnel Management's Evaluation of the Implementation of the 1978 Civil Service Reform Act.
AD-A107 180/2 1107

Problems with the Small Business Administration's Merit Appraisal and Compensation System.
AD-A107 181/0 1107

Review of Circumstances of the Mass Removal of Statutory Inspectors General.
AD-A107 189/3 1108

GOVERNMENT (FOREIGN)
Saudi Arabia: The Flexibility of Islamic Fundamentalism,
AD-A106 930/1 1102

GOVERNMENT POLICIES
Future Developments in the Food Industry and Their Implications for the Federal Trade Commission.
PB82-132366 1098

A Profile of the Medical Technology Industry and Governmental Policies. Volume I.
PB82-141821 1100

A Profile of the Medical Technology Industry and Governmental Policies: A Study of the Effects of Medicare/Medicaid Reimbursement and the 1976 Medical Device Amendments on the Pacemaker Industry. Volume II.
PB82-141839 1100

Assessing the Effects of the Section 8 Program Using the Urban Institute Housing Market Model,
PB82-144445 1101

GOVERNMENT PROCUREMENT
SBA's Progress in Implementing the Public Law 95-507 Subcontracting and Surety Bond Waiver Provisions has been Limited.
AD-A106 840/2 1088

The United States Synthetic Fuels Corporation's Project Selection Guidelines Need Clarification.
AD-A107 184/4 1266

Office of Management and Budget Circular Number A-76 as a Statement of Federal Procurement Policy.
AD-A107 259/4 1089

ADPE Acquisition: The Acquisition of the Naval Postgraduate School Computer, A Case Study.
AD-A107 478/0 1090

GRADIENT INDEX OPTICS
Engineering Aspects of Gradient-Index Optical Systems.
PB82-131996 1256

GRAINS (FOOD)
The Multicategory Case of the Sequential Bayesian Pixel Selection and Estimation Procedure.
N81-29498/5 1198

Ship Chartering Alternatives for Grain-Exporting Cooperatives.
PB82-130881 1098

GRAND BANKS
Oceanography of the Grand Banks Region of Newfoundland, March 1974 - October 1974.
AD-A107 452/5 1169

GRANITES
Thermomechanical Modeling and Data Analysis for Heating Experiments at Stripa, Sweden.
LBL-10193(Rev.) 1245

GRANTS
Still No Progress in Implementing Controls over Contracts and Grants with Indians.
AD-A106 830/3 1087

The Guaranteed Student Loan Information System Needs a Thorough Redesign to Account for the Expenditure of Billions.
AD-A106 875/8 1088

Ineffective Management of the Appropriate Technology Small Grants Program.
AD-A106 882/4 1088

Options for Establishing an Energy Conservation Consolidated Grant Program.
AD-A106 919/4 1180

Recent Awards: October-December 1978.
PB82-131921 1095

Applied Research Summary of Awards, Fiscal Year 1980.
PB82-132671 1092

Department of Transportation Awards to Academic Institutions in Fiscal Year 1980,
PB82-141508 1216

Grantee Budgeting for Federal and State Aid, Part 1: General Findings and Policy Options,
PB82-144957 1094

Grantee Budgeting for Federal and State Aid, Part 2: Jurisdictional Practices,
PB82-144965 1094

GRAPHITE
Study of Graphite/Epoxy Composites for Material Flaw Criticality.
AD-A107 391/5 1190

Phonons in Alkali Graphite Intercalation Compounds.
DE82000059 1151

Thermal Expansion of Alkali-Graphite Intercalation Compounds.
DE82000060 1151

Lattice Dynamics of Graphite Intercalation Compounds: Modelled by the Phonon Dispersion of Linear Chains.
DE82000061 1151

Survey of Matrix Materials for Solidified Radioactive High-Level Waste.
DE82000708 1244

Novel Improved PMR Polyimides.
N82-11117/0 1190

GRAVIMETRY
Evaluation of Gravimetric Ground Truth Soil Moisture Data Collected for the Agricultural Soil Moisture Experiment, 1978 Colby, Kansas, Aircraft Mission.
N81-29494/4 1169

GRAVITATIONAL EFFECTS
Growth of Solid Solution Single Crystals.
N82-11958/7 1253

GRAVITATIONAL FIELDS
Inertial Surveying Technology.
AD-A107 379/0 1157

GRAY SCALE
Techniques for Speckle Noise Removal.
AD-A107 125/7 1172

GREENHAVEN CORRECTION FACILITY DAM
National Dam Safety Program. Greenhaven Correction Facility Dam (Inventory Number N.Y. 11700), Lower Hudson River Basin, Duchess County, New York. Phase I Inspection Report,
AD-A107 400/4 1206

GROUND CONTROLLED INTERCEPTION
Behavioral Objectives for Air Intercept Controller Prototype Training System.
AD-A107 001/0 1106

GROUND EFFECT MACHINES
Surface Effect Vehicles/Ships in Marine Environments. 1970-November, 1981 (Citations from the Engineering Index Data Base).
PB82-802844 1224

Surface Effect Vehicles/Ships in Marine Environments. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802851 1224

GROUND MOTION
Probabilistic Analysis of Seismic Response of Multi-Supported Structures on Soft Soils (Analisis Probabilistico de la Respuesta Sismica de Estructuras Sobre Varios Apoyos en Suelos Blandos),
PB82-135377 1226

GROUND SOURCE HEAT PUMPS
Simple Computer Program to Model 3-Dimensional Underground Heat Flow with Realistic Boundary Conditions.
DE81030213 1200

GROUND STATIONS
Standard Engineering Installation Package. Air Traffic Radio Channel Control Equipment Change 1.
AD-A107 150/5 1236

GROUND SUBSIDENCE
Case Study Data Base Companion Report 3 to Simulation of Geothermal Subsidence (LBL-10571).
LBL-10839 1166

GROUND SUPPORT EQUIPMENT
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AD-A107 507/6 1237

GROUND TRUTH
Evaluation of Gravimetric Ground Truth Soil Moisture Data Collected for the Agricultural Soil Moisture Experiment, 1978 Colby, Kansas, Aircraft Mission.
N81-29494/4 1169

GROUND WATER
Heat Storage in Ground Water. Part 1. Study of Ground Water Reservoirs.
NE-PROJ-2060591(Pt.1) 1188

Heat Storage in Ground Water. Part 2. Study of Distribution Systems.
NE-PROJ-2060591(Pt.2) 1188

Water Resources Data for Louisiana, Water Year 1980. Volume 3: Coastal Louisiana.
PB82-129305 1160

Simulated Interactions between the Proposed Narrows Reservoir and the Water-Table Aquifer Along the South Platte River, Morgan County, Colorado.
PB82-131483 1211

Borehole Data-Collection Methods Applicable for the Regional Observation and Monitor Well Program, Southwest Florida Water Management District.
PB82-133448 1160

Water Resources Data for Indiana, Water Year 1980.
PB82-135930 1160

Water Resources Data for Florida, Water Year 1980. Volume 1: Northeast Florida.
PB82-136110 1160

Water Resources Data for Florida. Volume 4: Northwest Florida.
PB82-136128 1160

GROUND WATER RECHARGE
Effect of Irrigation Pumping on the Ground-Water System in Newton and Jasper Counties, Indiana.
PB82-137688 1081

GUATEMALA
Radar Mapping, Archaeology, and Ancient Land Use in the Maya Lowlands.
N82-11514/8 1104

GUIDED MISSILE SAFETY
Missile Safety Qualification of Short Range Air Defense (SHORAD) Missiles.
AD-A107 505/0 1232

GUIDED MISSILE SHIPS
Logistics Concerns over Navy's Guided Missile Frigate FFG-Class.
AD-A107 500/1 1224

GUIDED MISSILE SIMULATORS
Scale Modeling for the PATRIOT Electromagnetic Pulse Test.
AD-A107 480/6 1232

GUIDED MISSILE TRACKING SYSTEMS
Active RF Seeker Analysis for Land Combat Seekers.
AD-A106 947/5 1238

GUIDED MISSILE WARHEADS
Process for Fragment Layup, Filler Application, and Outer Coating for PATRIOT GM Warhead M248.
AD-A107 536/5 1232

GUIDED MISSILES
An Approach for Assessing Missile System Dormant Reliability.
AD-A107 519/1 1232

GUIDELINES
Permit Fee Guideline.
PB82-107871 1210

GUIDEWAY SYSTEMS
Non-Contacting Suspension and Propulsion Systems for Transportation Applications,
PB82-135591 1221

GULF OF MEXICO
Ocean Thermal Energy Conversion Preliminary Data Report for the February 1978 GOTEC-03 Cruise to the Gulf of Mexico, Mobile Site.
LBL-9438 1186

Plutonium in the Gulf of Mexico.
ORO-3852-36 1246

Uranium and Thorium Series Isotopes in Nearshore Marine Sediments.
ORO-3852-38 1246

Proposed Gulf of Mexico OCS Oil and Gas Sales 67 and 69.
PB82-109430 1210

GULF STREAM
Synoptic Observations of the Three-Dimensional Structure and Propagation of Gulf Stream Meanders Along the Carolina Continental Margin.
AD-A107 226/3 1156

GUN MUZZLES
Use of Foam to Reduce Gun Blast Noise Levels.
AD-A107 081/2 1251

Muzzle Flow in the Presence of an Anti-Recoil Plate: Exploratory Study.
AD-A107 314/7 1251

Shock Tube Tests of Muzzle Blast Transducers.
AD-A107 319/6 1251

GUNNERY TRAINERS
Simulated Tank Anti-Armor Gunnery System (STAGS).
AD-A107 481/4 1251

GUNS
Weapon Characteristics.
AD-A107 310/5 1251

Secondary Combustion in Gun Exhaust Flows.
AD-A107 312/1 1251

GUST LOADS
Aeroacoustic Theory for Noncompact Wing-Gust Interaction.
N82-11071/9 1078

GUYANA
The Income and Production of Guyana Rural Farm Households: An Analysis Based on the 1979 Guyana Rural Farm Household Survey.
PB82-131442 1114

GYROSCOPES
Microcreep of Instrument Grade Beryllium.
PB82-137415 1193

HABITATS
Nationwide Forestry Applications Program. Analysis of Forest Classification Accuracy.
N81-29499/3 1081

An Assessment of Wetland Habitat Establishment at a Central Florida Phosphate Mine Site.
PB82-130808 1211

Coal Surface Mining Reclamation and Fish and Wildlife Relationships in the Eastern United States. Volume II: Opportunities and Approaches for Fish and Wildlife Planning and Management in Coal Surface Mining, Reclamation and Postmining Land Uses.
PB82-130824 1211

Evaluation of Existing Marine Intertidal and Shallow Subtidal Biologic Data,
PB82-134065 1155

User's Guide to the Physical Habitat Simulation System (PHABSIM).
PB82-134222 1160

Distribution and Abundance of Marine Birds and Mammals Wintering in the Kodiak Area of Alaska.
PB82-140187 1155

HABITS

USAF Food Habits Study. Part IV. Selections, Quantities Selected, and Perceived Portion Sizes.
AD-A107 307/1 1137

HADRON-HADRON INTERACTIONS

Model for the Hadron-Hadron Vertex: Dynamic Origin of the OZI Rule.
PB82-137381 1260

HADRON REACTIONS

Proton Multiplicity Distributions in High-Energy Hadron-Nuclei Collisions.
JINR-E-1-12068 1258

HADRONS

Transverse Properties of Hadrons Produced in Neutrino-Nucleon Scattering in BEBC,
PB82-135732 1260

HAFNIUM

The 4f(13)5f Configuration in the Isoelectronic Sequence of Yb III.
PB82-137407 1153

HAFNIUM ALLOYS

Erosion-Corrosion-Wear Program.
LBL-11109 1192

HALF LIFE

A Review and Interpretation of Recent Cosmic Ray Beryllium Isotope Measurements.
N82-12020/5 1083

HALLEY'S COMET

Telecommunications in Cometary Environments.
N82-11340/8 1234

HALOGEN ORGANIC COMPOUNDS

Removing Trihalomethanes from Drinking Water - An Overview of Treatment Techniques.
PB82-132572 1212

HANDBOOKS

Forecasting Municipal Revenues and Expenditures: A Primer and Handbook,
PB82-144528 1093

Negotiating Fiscal Impacts: A Handbook for Evaluating City Development.
PB82-144551 1217

HANDICAPPED PERSONS

Limits on Receipt of Multiple Disability Benefits Could Save Millions.
AD-A106 874/1 1106

HARBORS

Recreational Boat Harbor, Cedar River, Michigan. Revisions to General Design Memorandum Number 1 and Environmental Impact Statement. Supplement Number 1.
AD-A107 091/1 1205

Port and Harbor Safety. 1974-1981 (Citations from Oceanic Abstracts).
PB82-857939 1227

HARDENING (MATERIALS)

General Derivation of Hardening Formulas,
PB82-132937 1219

HARTFORD (CONNECTICUT)

Can Community Economic Development Meet the Fiscal Needs of Municipalities. Economic Growth and Fiscal Stress in Three Northeast Cities,
PB82-144510 1101

HAULAGE EQUIPMENT

Extensible Bridge-Conveyor Concepts for Coal-Mine Face Haulage. Final Technical Report as of 21 April 1981.
DE81031974 1161

HAYNES ALLOYS

Thermophysical Properties of Selected Wear-Resistant Alloys.
HEDL-TME-79-6 1192

HAYNES STELLITE NO 21

Thermophysical Properties of Selected Wear-Resistant Alloys.
HEDL-TME-79-6 1192

HAZARDOUS MATERIALS

Installation Restoration Program Records Search for Langley Air Force Base, Virginia.
AD-A106 864/2 1203

Installation Restoration Program. Phase I. Records Search, Hazardous Materials Disposal Sites. Myrtle Beach AFB, South Carolina.
AD-A107 358/4 1205

Survey of On-Going and Completed Remedial Action Projects.
PB82-134115 1213

An Analysis of the Scope of Federal Laws and Regulations Controlling Exposures to Substances Which Cause Occupational Respiratory and Pulmonary Diseases.
PB82-134198 1103

Hazardous Materials Transportation. 1970-October, 1981 (Citations from the Engineering Index Data Base).
PB82-802802 1218

HAZARDOUS MATERIALS TRANSPORTATION

Hazardous Materials Transportation. 1970-October, 1981 (Citations from the Engineering Index Data Base).
PB82-802802 1218

HAZARDS

The Worldwide Navigational Warning Service,
AD-A107 372/5 1234

HAZE

An Analysis of Haze Effects on Landsat Multispectral Scanner Data.
N81-29497/7 1080

HEALING

Evaluation of the Parietal Bones in the Rat as a Specific Site for the Testing of Osteogenic Materials. A Simple Animal Model to Study Bone Implant Material.
AD-A107 036/6 1123

HEALTH

Health and Safety Deficiencies Found at Water Recreation Areas.
AD-A106 827/9 1122

Improvements Needed in Assessing Penalties and Controlling Penalty Collections Resulting from Occupational Safety and Health Inspections.
AD-A106 848/5 1138

HEALTH CARE COSTS

Evaluation of the Colorado Clincial Psychology/Expanded Mental Health Benefits Experiment. Volume V: Impact of the Experiment on the Use, Cost, and Delivery of Medicare Services.
PB82-136193 1134

Differential Reimbursement of Hospitals.
PB82-138124 1134

HEALTH CARE DELIVERY

Mental Health Services: Delivery Plans, Programs, and Studies. 1966-November, 1981 (Citations from the NTIS Data Base).
PB82-802703 1112

HEALTH CARE FACILITIES

Flexitime in an Army Medical Center.
AD-A107 470/7 1109

New Approaches to Evaluating Firesafety in Buildings: Proceedings of a Conference, September 20-21, 1978, Washington, DC.
PB82-146341 1227

HEALTH CARE REQUIREMENTS

Determination of System Needs, and Associated Data Needs, SHCC Guidelines for Fourth HSPs (Section IX).
HRP-0903731/8 1128

Mental Health Services: Needs and Demands. 1973-November, 1981 (Citations from the NTIS Data Base).
PB82-802711 1113

HEALTH CARE TECHNOLOGY

A Profile of the Medical Technology Industry and Governmental Policies. Volume I.
PB82-141821 1100

A Profile of the Medical Technology Industry and Governmental Policies: A Study of the Effects of Medicare/Medicaid Reimbursement and the 1976 Medical Device Amendments on the Pacemaker Industry. Volume II.
PB82-141839 1100

A Profile of the Medical Technology Industry and Governmental Policies. Appendix A: Review and Assessment of Secondary Data Sources for Developing a Profile of the Medical Technology Industry.
PB82-141847 1141

HEALTH CARE UTILIZATION

Evaluation of the Colorado Clincial Psychology/Expanded Mental Health Benefits Experiment. Volume V: Impact of the Experiment on the Use, Cost, and Delivery of Medicare Services.
PB82-136193 1134

HEALTH INFORMATION SYSTEMS

Patient Tracking for High Blood Pressure Control.
PB82-107525 1130

HEALTH INSURANCE

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Executive Summary.
PB82-136144 1133

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume I: Description of the Experiment.
PB82-136151 1133

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume II: Process Evaluation.
PB82-136169 1133

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume III: Provider Questionnaire.
PB82-136177 1133

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume IV: Beneficiary Survey.
PB82-136185 1133

Evaluation of the Colorado Clincial Psychology/Expanded Mental Health Benefits Experiment. Volume V: Impact of the Experiment on the Use, Cost, and Delivery of Medicare Services.
PB82-136193 1134

HEALTH LEGISLATION

An Analysis of the Scope of Federal Laws and Regulations Controlling Exposures to Substances Which Cause Occupational Respiratory and Pulmonary Diseases.
PB82-134198 1103

HEALTH MANPOWER

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Wisconsin, Volume 49, Part 1.
HRP-0903691/4 1124

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Wisconsin, Volume 49, Part 2.
HRP-0903692/2 1124

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Wyoming, Volume 50.
HRP-0903693/0 1124

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Virginia, Volume 46, Part 1.
HRP-0903694/8 1124

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Virginia, Volume 46, Part 2.
HRP-0903695/5 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: West Virginia, Volume 48, Part 1.
HRP-0903696/3 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: West Virginia, Volume 48, Part 2.
HRP-0903697/1 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Washington, Volume 47.
HRP-0903698/9 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Idaho, Volume 13.
HRP-0903699/7 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Illinois, Volume 14, Part 1.
HRP-0903700/3 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Illinois, Volume 14, Part 2.
HRP-0903701/1 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Indiana, Volume 15, Part 1.
HRP-0903702/9 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Indiana, Volume 15, Part 2.
HRP-0903703/7 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kansas, Volume 16, Part 1.
HRP-0903704/5 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kansas, Volume 16, Part 2.
HRP-0903705/2 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kentucky, Volume 17, Part 1.
HRP-0903706/0 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kentucky, Volume 17, Part 2.
HRP-0903707/8 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Louisiana, Volume 18, Part 1.
HRP-0903708/6 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Louisiana, Volume 18, Part 2.
HRP-0903709/4 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Massachusetts, Volume 21.
HRP-0903710/2 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Maine, Volume 19.
HRP-0903711/0 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Maryland, Volume 20.
HRP-0903712/8 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Tennessee, Volume 42, Part 1.
HRP-0903713/6 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Tennessee, Volume 42, Part 2.
HRP-0903714/4 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Pennsylvania, Volume 38, Part 1.
HRP-0903715/1 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Pennsylvania, Volume 38, Part 2.
HRP-0903716/9 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Rhode Island, Volume 39.
HRP-0903717/7 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: South Carolina, Volume 40.
HRP-0903718/5 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: South Dakota, Volume 41, Part 1.
HRP-0903719/3 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: South Dakota, Volume 41, Part 2.
HRP-0903720/1 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Utah, Volume 44.
HRP-0903721/9 1128

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Vermont, Volume 45.
HRP-0903722/7 1128

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Texas, Volume 43, Part 1.
HRP-0903723/5 1128

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HRP-0903724/3 1128

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Texas, Volume 43, Part 3.
HRP-0903725/0 1128

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HRP-0903726/8 1128

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Texas, Volume 43, Part 5.
HRP-0903727/6 1128

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HRP-0903770/6 1129

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HRP-0903771/4 1129

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HRP-0903772/2 1129

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HRP-0903773/0 1129

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: New York, Volume 32, Part 2.
HRP-0903774/8 1130

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: New Mexico, Volume 31.
HRP-0903775/5 1130

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: North Dakota, Volume 34.
HRP-0903776/3 1130

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: North Carolina, Volume 33, Part 1.
HRP-0903777/1 1130

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HEALTH PHYSICS
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HEALTH PLANNING
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Health Planning Reports: Abstracts. Volume 2, A-7971 through A-16333.
HRP-0903307/7 1124

Economic Impact and Project Selection Methodology for Certificate of Need.
HRP-0903735/9 1129

HEALTH PLANNING AGENCIES
The Health Systems Agency Role in Building Primary Care Systems at the Local Level: A Recent Example,
HRP-0903737/5 1129

HEALTH RISKS
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HEALTH SERVICES
Rape Response: A Research Demonstration Project,
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HEALTH SERVICES RESEARCH
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Health Planning Reports: Abstracts. Volume 2, A-7971 through A-16333.
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HEALTH SYSTEMS AGENCIES
The Health Systems Agency Role in Building Primary Care Systems at the Local Level: A Recent Example,
HRP-0903737/5 1129

HEALTH SYSTEMS PLANS
Determination of System Needs, and Associated Data Needs, SHCC Guidelines for Fourth HSPs (Section IX).
HRP-0903731/8 1128

HEART
Testing of RPMI-1640 as a Nutrient Medium for Fresh Semilunar Valve Storage.
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HEART RATE
Power Spectrum Analysis of Heart Rate Fluctuation: A Quantitative Probe of Beat-to-Beat Cardiovascular Control.
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HEART SURGERY
The Non-Invasive Evaluation of the Coronary Artery Disease Patient: Clinical, Economic, and Social Issues,
PB82-137951 1134

HEART VALVES
Testing of RPMI-1640 as a Nutrient Medium for Fresh Semilunar Valve Storage.
AD-A106 824/6 1140

HEAT BALANCE
Heat Balance and Transfer in Men and Women Exercising in Hot-Dry and Hot-Wet Conditions.
AD-A107 004/4 1144

Single-Room Heat Balance for Building Heat Transfer,
PB82-135609 1226

HEAT CAPACITY MAPPING MISSION
Thermal Algorithms Analysis.
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HEAT DISTRIBUTION SYSTEMS
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HEAT EXCHANGERS
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HEAT FLUX
Bottom Heat Transfer to Water Bodies in Winter.
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Engineering - Economic Analysis of Improved Heat Pump Performance for Minimum Standards Development.
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Development of a Directly-Fired Heat Pump for Domestic and Light Commercial Application.
PB82-137191 1202

HEAT RECOVERY
Heat Energy Recovery from Domestic Output Fluids (HERDOF),
PB82-134156 1188

High Temperature Metallic Recuperator.
PB82-141102 1202

HEAT RECOVERY EQUIPMENT
Materials Analyses of Ceramics for Glass Furnace Recuperators.
ORNL/TM-6970 1190

HEAT RESISTANT ALLOYS
Trends in High Temperature Gas Turbine Materials.
N82-11182/4 1193

HEAT SINKS
Radiative Cooler.
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HEAT STORAGE
Thermal Energy Storage Systems. Part I.
PB82-137589 1188

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HEAT STROKE
Effect of Low Potassium Diet on Rat Exercise Hyperthermia and Heatstroke Mortality.
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HEAT TRANSFER
Bottom Heat Transfer to Water Bodies in Winter.
AD-A106 977/2 1159

Heat Balance and Transfer in Men and Women Exercising in Hot-Dry and Hot-Wet Conditions.
AD-A107 004/4 1144

Wind Tunnel Tests of Elevon Gap Heating on the Space Shuttle Orbiter (OH-107).
AD-A107 287/5 1272

Boiling Heat Transfer in Confined Space.
AD-A107 363/4 1200

Modeling Solid-Fuel Ramjet Combustion Including Radiation Heat Transfer to the Fuel Surface.
AD-A107 441/8 1270

Design Model for the Heat Transfer in a Short Straight Tube Boiler.
AD-A107 454/1 1200

Meridional Heat Transport at the Onset of Winter Stratospheric Warming.
N82-11697/1 1085

Jet Impingement Heat Transfer Enhancement for the GPU-3 Stirling Engine.
N82-11993/4 1271

Boundary-Fitted Coordinate Transformation for Thermo-hydraulic Analysis in Arbitrary Three-Dimensional Geometries,
NUREG/CR-2313 1197

Documentation of Program for Determination of Conduction Transfer Functions,
PB82-136284 1226

HEAT TREATMENT
Mechanisms of Recovering Low Cycle Fatigue Damage in Incoloy 901.
AD-A107 255/2 1192

HEATERS
Transient Annealing of Arsenic-Implanted Silicon Using a Graphite Strip Heater.
AD-A107 230/5 1222

HEATING EQUIPMENT
Experimental Study of Fuel Heating at Low Temperatures in a Wing Tank Model, Volume 1.
N82-11224/4 1268

HEATING OILS
Catalytic Combustion with Incompletely Vaporized Residual Fuel.
DE82000419 1265

Rate Guide for Residential No. 2 Heating Oil and Coal for SOLCOST Data Bank Cities.
DE82000483 1268

HEAVY ION REACTIONS
Relativistic Heavy-Ion Experiments.
DE81030544 1257

Nucleus-Nucleus Interaction in the Glauber Approximation.
JINR-R-2-12079 1258

HEAVY WATER
The Equation of State of D2O Determined from Sound Speeds.
AD-A107 203/2 1149

HEISENBERG FERROMAGNETS
Spin-Wave Damping in the Quantum Ising-Heisenberg Chain,
PB82-134149 1263

HELICOPTER ENGINES
Diagnostic and Condition Monitoring System Assessment for Army Helicopter Modular Turboshaft Engines.
AD-A107 315/4 1270

HELICOPTERS
Helicopter Rotor Trailing Edge Noise.
N82-11859/7 1078

HELIUM
Energy and Tangential Momentum Accommodation on Different Flashed Tungsten and Gas Covered Tungsten Surfaces.
AD-A107 495/4 1149

HELIUM 3 TARGET
Differential Cross Sections for p + exp 3 He Scattering from 19.5 to 47.5 MeV.
LA-8179-MS 1259

HELMETS
Protection Factors of the Airstream Helmet.
PB82-135575 1143

HELMHOLTZ FREE ENERGY
New Generating Functions and Results for the Density Polynomials of the Lattice Gas.
PB82-137365 1263

HEMODIALYSIS
Effects of Exercise Training on Lipid and Carbohydrate Metabolism in Hemodialysis Patients.
PB82-137860 1134

HEPATOCELLULAR CARCINOMA
A New Concept on the Natural Course of Hepatocellular Carcinoma,
PB82-129669 1131

HEREDITARY DISEASES
Case of Hereditary (4;5) Translocation Discovered Prenatally,
PB82-129693 1131

HETERODYNING
A 10.6 micrometer Amplitude Modulated Telemeter Laser with Nonlinear Postdetection: Study of a Single Laser System--Translation.
AD-A107 475/6 1256

HETEROJUNCTION DEVICES
InGaAsP/InP Laser Development for Single-Mode, High-Data-Rate Communications.
N82-11452/1 1255

HETEROJUNCTIONS
Time Dependence of Current at High Electric Fields in Al(x)Ga(1-x)As-GaAs Heterojunction Layers.
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HEXADECANE
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HIGH BTU GAS
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HIGH LEVEL LANGUAGES
'Pseudo', A Macro-Based High Level Language for the PDP-11,
AD-A107 168/7 1172

The Impact of Multiprocessor Technology on High-Level Language Design.
AD-A107 533/2 1173

SYCOL: Informal Language Specification,
PB82-135658 1176

SYCOL: A High Level Language for Applications in Real Time Control Systems,
PB82-135666 1176

HIGH-LEVEL RADIOACTIVE WASTES
High-Current Resistance Welding of Nuclear-Waste Containers.
DE81030403 1243

HIGH PRESSURE
JT8D High Pressure Compressor Performance Improvement.
N82-11467/9 1270

HIGH RISE BUILDINGS
Air Exchange Measurements in a High Rise Office Building.
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HIGH-TEMPERATURE FUEL CELLS
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HIGH TEMPERATURE RESEARCH
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N82-11120/4 1189

HIGHWAY BRIDGES
Evergreen Point Bridge Maintenance Problems, 1980.
PB82-128489 1210

Evergreen Point Bridge Maintenance Problems, 1977.
PB82-128505 1211

Wave Forces on Causeway-Type Coastal Bridges: Effects of Angle of Wave Incidence and Cross-Section Shape.
PB82-131657 1211

HIGHWAY SIGNS
Alternative Sign Sequences for Work Zones on Rural Highways. Executive Summary.
PB82-132812 1213

HIGHWAY TRANSPORTATION
Yellow Bar Experimental Carriageway Markings - Accident Study,
PB82-135328 1225

HIGHWAYS
Finance Issues: County Highways and Public Transit,
PB82-128828 1091

Methods for Allocating Highway Costs.
PB82-130501 1211

Safety Effectiveness Evaluation: Federal Highway Administration Non-Interstate Resurfacing, Restoration, and Rehabilitation Program.
PB82-131699 1212

HISPANICS
Interpersonal Relations Among Hispanics in the United States: A Content Analysis of the Social Science Literature.
AD-A107 460/8 1113

HISTONES
Staphylococcus Aureus Protease: A Probe of Exposed, Non-Basic Histone Sequences in Nucleosomes.
DE81030486 1120

HISTORIC PRESERVATION
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PB82-140351 1104

HOISTS
Development of a Man and Supply Hoisting System for Underground Metal and Nonmetal Mines. Volume II. Operation and Maintenance Manual.
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HOLOGRAPHY
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AD-A107 020/0 1230

HOME HEALTH AGENCIES
Analysis of Nursing Manpower Shortages in Merrimack Valley Home Health Care Agencies, Part I: The Nature and Severity of the Shortage.
HRP-0903740/9 1129

HOMES
Evaluation of Formaldehyde Problems in Residential Mobile Homes.
PB82-144619 1136

HOMOGENEOUS TURBULENCE
Mixing of a Passive Scalar in Isotropic and Sheared Homogeneous Turbulence.
N82-11394/5 1254

Numerical Simulation of a Compressible Homogeneous, Turbulent Shear Flow.
N82-11396/0 1254

HONDURAS
Assessment of the Public Health Sector in Honduras, 1975-1985.
PB82-131095 1131

HORIZONTAL FLIGHT
Algorithm for Fuel Conservative Horizontal Capture Trajectories.
N82-11018/0 1076

Parametric Study of Microwave-Powered High-Altitude Airplane Platforms Designed for Linear Flight.
N82-11050/3 1077

HOSPICES
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HOSPITAL INFORMATION SYSTEMS
Methods for Evaluating Costs of Automated Hospital Information Systems.
PB82-134073 1096

HOSPITALS
An Information System for the Peruvian Air Force Hospital.
AD-A107 440/0 1124

Differential Reimbursement of Hospitals.
PB82-138124 1134

HOT CORROSION
Silicon Carbide as an Oxidation-Resistant High-Temperature Material. 1: Oxidation and Heat Corrosion Behavior.
N82-11120/4 1189

HOT-DRY-ROCK SYSTEMS
Magnetotelluric/Audiomagnetotelluric Study of the Zuni Hot Dry Rock Geothermal Prospect, New Mexico.
LA-UR-80-1486 1165

Directional Drilling Equipment and Techniques for Deep Hot Granite Wells.
LA-UR-80-2086 1165

Location of Hydraulic Fractures Using Microseismic Techniques.
LA-UR-80-2103 1165

HOT DRY ROCKS
Feasibility of the Connection of Wells in Hot Dry Rocks by Means of Hydraulic Fracturing Techniques: Experimental Research Dealing with Three-Dimensional Crack Interaction, Largely Utilizing Photoelastic Techniques.
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HOT FILM ANEMOMETERS
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HOT PLASMA
Search for Promethium-Like Gold Lines and Other Transitions of Interest to Fusion Research.
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HOT PRESSING
Mechanisms of Recovering Low Cycle Fatigue Damage in Incoloy 901.
AD-A107 255/2 1192

HOT SIDE PRECIPITATORS
Improvement of Hot-Side Precipitator Performance with Sodium Conditioning--An Interim Report.
PB82-134107 1213

HOT-WATER SYSTEMS
Formation Evaluation in Liquid-Dominated Geothermal Reservoirs.
DOE/ET/28384-T1 1162

Analysis of Injection Testing of Geothermal Reservoirs.
LBL-10985 1166

HOT WIRE ANEMOMETERS
Hot-Wire and Hot-Film Anemometers.
AD-A107 213/1 1228

HOT WORKING
Hot-Wire and Hot-Film Anemometers.
AD-A107 213/1 1228

HOUSEHOLDS
The Income and Production of Guyana Rural Farm Households: An Analysis Based on the 1979 Guyana Rural Farm Household Survey.
PB82-131442 1114

HOUSES
Saving Half of California's Energy and Peak Power in Buildings and Appliances Via Long-Range Standards and Other Legislation.
LBL-6865 1182

Evaluation of Residential Building Energy-Performance Standards.
LBL-9816 1201

Theory and Design of an Annual Cycle Energy System (ACES) For Residences.
ORNL/CON-43 1201

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HOUSING
Methodology for Collecting Data.
PB82-144379 1096

Assessing the Effects of the Section 8 Program Using the Urban Institute Housing Market Model,
PB82-144445 1101

Selling the Solar Home '80: Market Findings for the Housing Industry.
PB82-144668 1116

Effect of Race on Opinions of Structure and Neighborhood Quality,
PB82-144825 1118

Codebook for the Household Survey, Site I, Wave 3. Housing Assistance Supply Experiment,
PB82-144908 1119

Developer Supply, Investor Demand, and Multifamily Housing Production: A Pilot Study,
PB82-144916 1119

Audit of the Survey of Residential Buildings, Site I, Wave 3. Housing Assistance Supply Experiment,
PB82-144932 1119

Audit of the Survey of Residential Buildings, Site I, Wave 2. Housing Assistance Supply Experiment,
PB82-144940 1119

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PB82-145012 1119

Housing Allowance Demand Experiment: Final Report,
PB82-145020 1119

HOUSING (DWELLINGS)
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AD-A106 832/9 1203

Ohio's 1981 Home Energy Assistance Program.
AD-A106 872/5 1180

HUD's Oversight of Procurement by Public Housing Authorities Needs Strengthening.
AD-A106 895/6 1089

Energy-Efficient and Cost-Effective Equipment Should be Installed in New Government Housing.
AD-A106 900/4 1199

HOUSING PROJECTS
Inquiry into the Status of a Proposal to Construct 16 Single-Family Detached Homes for the Cuyahoga Metropolitan Housing Authority in Cleveland, Ohio.
AD-A106 891/5 1113

Energy-Efficient and Cost-Effective Equipment Should be Installed in New Government Housing.
AD-A106 900/4 1199

HOUSING STUDIES

A Methodology for Evaluating Housing in Use: A Case Study Approach,
PB82-104969 1113

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PB82-137027 1114

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PB82-144486 1116

Artists' Spaces: A Study of the Development of Artists' Living and Working Space in Boston,
PB82-144650 1116

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PB82-144742 1117

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Assessment of Urban County Performance: Community Development Block Grant Program.
PB82-144833 1118

Fiscal Year 1981 Research and Technology Program.
PB82-144841 1118

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HTGR TYPE REACTORS

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HUMAN FACTORS ENGINEERING

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AD-A107 225/5 1079

Communications Intelligence: Transcriber Output Enhancement.
AD-A107 296/6 1103

Experimental Investigation of Near Real-Time Interpretation Techniques for Transmitted Imagery.
AD-A107 515/9 1103

Standard Specification for Industrial Safety-Belt Assemblies.
N82-11278/0 1225

HUMAN POPULATIONS

CRRIS: A Computerized Radiological Risk-Investigation System.
DE82000136 1143

HUMAN REACTIONS

Effects of Aircraft Noise on the Equilibrium of Airport Residents: Testing and Utilization of a New Methodology.
N82-11636/9 1112

HUMAN RESOURCES

Department of Labor Needs to Give CETA Prime Sponsors More Guidance and Assistance for Implementing Monitoring Requirements.
AD-A106 847/7 1105

Systems Are Not Solutions: Issues in Creating Information Systems That Account for the Human Organization.
AD-A106 866/7 1094

Supply Workload Implications of Increased Deployment to the Indian Ocean.
AD-A106 994/7 1230

Follow-Up on Actions to Improve Coordination and Utilization of Human Resources Research and Development.
AD-A107 179/4 1107

HUNTINGTONS CHOREA

Brain Destruction Alone Does Not Elevate Brain Aluminum.
PB82-133968 1132

HURRICANES

Wave Forces on Causeway-Type Coastal Bridges: Effects of Angle of Wave Incidence and Cross-Section Shape.
PB82-131657 1211

HVDC SYSTEMS

High Voltage Direct Current Network Modeling and Simulation. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
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High Voltage Direct Current Insulators and Insulation Methods. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-858853 1171

HYBRID ELECTRIC-POWERED VEHICLES

Method for Estimating Technological Penetration Rates in Commercial Automobile Fleets.
DE82000433 1221

HYBRID SIMULATION

Quasineutral Hybrid Simulation of Macroscopic Plasma.
AD-A107 468/1 1260

HYDRATES

Kinetics of Gas Hydrate Formation. Part I: Kinetics of Ethane Gas Hydrate Formation. Part II: Kinetics of Natural Gas Hydrate Formation.
PB82-138868 1153

HYDRAULIC FRACTURES

Location of Hydraulic Fractures Using Microseismic Techniques.
LA-UR-80-2103 1165

HYDRAULIC FRACTURING

Feasibility of the Connection of Wells in Hot Dry Rocks by Means of Hydraulic Fracturing Techniques: Experimental Research Dealing with Three-Dimensional Crack Interaction, Largely Utilizing Photoelastic Techniques.
PB82-140138 1167

HYDRAULIC JETS

Water Jet Perforation: A New Method of Completing and Simulating In situ Leaching Wells.
PB82-135583 1167

HYDRAULIC SERVOMECHANISMS

Electrohydraulic Control Systems. 1973-1981 (Citations from the BHRA Fluid Engineering Data Base).
PB82-856576 1177

HYDRAULIC TURBINES

Compensation of the Speed Governor of a Water Turbine by the Method of Inequalities,
PB82-136011 1224

HYDRAZINES

Monitoring Calcium in Trout Eggs Exposed to Hydrazine.
AD-A107 138/0 1144

HYDRIDES

Laser-Induced-Fluorescence Studies of Fragment Ions: CH Exp + and CD exp + .
DE82001010 1151

HYDROCARBONS

Direct Detection of Hydrocarbons Using Seismic Procedures--Translation.
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HYDRODYNAMICS

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AD-A106 987/1 1224

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HYDROELECTRIC POWER

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DOE/RA/11025-T1(V.1) 1186

HYDROELECTRICITY

Water, Watts, and Wilds Hydropower and Competing Uses in New England.
AD-A107 173/7 1184

HYDROGEN

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LA-UR-80-1252 1190

Nuclear Materials Research Progress Reports for 1979.
LBL-11030 1249

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MLM-2727 1240

HYDROGEN ATOMS

Charge Transfer in Collisions of Li-3(+) And Be-4(+) Ions with Atomic Hydrogen at Low Impact Energy.
N82-11927/2 1152

HYDROGEN EMBRITTLEMENT

A Fracture Limit Diagram for Determining Hydrogen Embrittlement of Sheet under Multiaxial Loading Conditions.
AD-A107 116/6 1191

HYDROGEN FUELS

Technical and Economic Aspects of Hydrogen Storage in Metal Hydrides.
N82-11223/6 1268

The Storage of Hydrogen in the Form of Metal Hydrides: An Application to Thermal Engines.
N82-11225/1 1269

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HYDROGEN PRODUCTION

Experimental Work Related to Two Bismuth Sulfate Cycles and Their Possible Improvement. Outline of a Possible Antimonyl Sulfate Cycle with Separate Evolution of Sulfur Dioxide and Oxygen.
DE81030236 1267

LASL Thermochemical Hydrogen Program Status on September 30, 1980.
LA-UR-80-2400 1268

Hybrid Processes for the Production of Hydrogen (Hybridprozesse zur Wasserstofferzeugung).
PB82-139452 1269

HYDROGEOLOGY

Borehole Data-Collection Methods Applicable for the Regional Observation and Monitor Well Program, Southwest Florida Water Management District.
PB82-133448 1160

HYDROGRAPHY

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AD-A107 080/4 1168

HYDROLOGIC DATA

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PB82-129305 1160

Water Resources Data for Indiana, Water Year 1980.
PB82-135930 1160

Water Resources Data for Florida. Volume 4: Northwest Florida.
PB82-136128 1160

HYDROLOGY

Geothermal Potential on Kirtland Air Force Base Lands, Bernalillo County, New Mexico.
AD-A107 044/0 1157

Selected Hydrologic Relationships for Soldier Creek, Northeastern Kansas.
PB82-138751 1160

HYDROMETEORS
Effect of Hail, Snow, and Melting Hydrometeors on Millimeter Radio Waves.
AD-A107 429/3 1264

HYDROPHOBIC PROPERTIES
The Fracture of Thermosetting Resins after Exposure to Water.
AD-A107 237/0 1195

HYDROTHERMAL SYSTEMS
SHAFT79 User's Manual.
LBL-10861 1166

HYPERGEOMETRIC FUNCTIONS
Two New Bifurcation Phenomena.
AD-A107 011/9 1196

HYPERSONIC FLOW
Steady/Oscillatory, Supersonic/Hypersonic Inviscid Flow Past Oscillating Wings and Wedge Combinations at Arbitrary Angles of Attack.
AD-A107 438/4 1076

HYPERTENSION
Effects of Curative Treatment Emphasizing Endurance Training on the Performance and Blood Pressure of Hypertensive and Normotensives.
N82-11771/4 1144

Patient Tracking for High Blood Pressure Control.
PB82-107525 1130

HYPERTHERMIA
Effect of Low Potassium Diet on Rat Exercise Hyperthermia and Heatstroke Mortality.
AD-A107 006/9 1144

Effects of Hyperthermia and Radiation. 1978-1981 (Citations from the Energy Data Base).
PB82-859968 1135

HYPOKINESIA
Cyclic Nucleotides in Tissues During Long-Term Hypokinesia.
N82-11757/3 1144

Electron Microscopical and Histochemical Studies on the Transverse Striated Muscles of Birds after Prolonged Hypokinesis.
N82-11759/9 1144

HYSTERESIS
Application of a Rare-Earth Cobalt Magnet to Synchronous Motors.
N82-11358/0 1171

IAEA SAFEGUARDS
Materials Management in an Internationally Safeguarded Fuels Reprocessing Plant.
LA-8042(V.1) 1248

Materials Management in an Internationally Safeguarded Fuels Reprocessing Plant.
LA-8042(V.3) 1249

ICE
Cutting Ice with High Pressure Water Jets--Translation.
AD-A106 985/5 1169

Determination of Ice Crystal Growth Parameters in a Supercooled Cloud Tunnel.
AD-A107 263/6 1084

ICE CRYSTALS
Determination of Ice Crystal Growth Parameters in a Supercooled Cloud Tunnel.
AD-A107 263/6 1084

ICE FORMATION
Selected Bibliography of Naca-NASA Aircraft Icing Publications.
N82-11053/7 1078

Evaluation of Photogrammetric Flight under Icing Conditions on March 23, 1978.
N82-11725/0 1087

ICE PREVENTION
Icing Tunnel Tests of a Composite Porous Leading Edge for Use with a Liquid Anti-Ice System.
N82-11052/9 1078

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N82-11053/7 1078

ICEBERGS
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AD-A107 452/5 1169

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HRP-0903699/7 1125

Occupational Injuries and Illnesses, Idaho, 1979.
PB82-100041 1139

IDAHO CHEMICAL PROCESSING PLANT
Mockup Testing of Remote Systems for Zirconium Fuel Dissolution Process at the Idaho Chemical Processing Plant.
CONF-791103-70 1243

IDENTIFICATION
Determination of the Relationship between Information Capacity and Identification by Simulated Aerial Photography.
AD-A107 485/5 1230

IDENTIFICATION SYSTEMS
Management of the Department of State Office of Passport Services Needs to be Improved.
AD-A106 880/8 1088

Results of Fingerprint Image Quality Experiments,
PB82-133539 1114

IGNITION
Acceleration of Methane-Air Ignition by Hydrocarbon Additives.
AD-A107 009/3 1272

Ignition of Composite Propellants under Rapid Pressure Loading.
AD-A107 147/1 1271

IGNITION SYSTEMS
Application of Intermittent Ignition Devices to Commercial Cooking Equipment.
PB82-141078 1138

ILLINOIS
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Illinois, Volume 14, Part 1.
HRP-0903700/3 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Illinois, Volume 14, Part 2.
HRP-0903701/1 1125

Users Manual for the US Baseline Corn and Soybean Segment Classification Procedure.
N81-29504/0 1080

IMAGE PROCESSING
Tomographic Reconstruction of Strongly Refracting Fields and Its Application to Interferometric Measurement of Boundary Layers.
AD-A106 823/8 1229

Circular and Extended Circular Harmonic Transforms and Their Relevance to Image Reconstruction from Line Integrals.
AD-A107 050/7 1196

Digital Filters for Infrared Target Acquisition Sensors.
AD-A107 061/4 1236

Cluster Analysis Algorithms for Image Segmentation.
AD-A107 110/9 1172

Techniques for Speckle Noise Removal.
AD-A107 125/7 1172

Image Segmentation with Color and Texture,
AD-A107 479/8 1173

Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236

Meteorological Factors in High Resolution Satellite Imagery (DMSP).
AD-A107 512/6 1084

Estimation of Proportions in Mixed Pixels Through Their Region Characterization.
N81-29510/7 1198

Evaluation of Large Area Crop Estimation Techniques Using Landsat and Ground-Derived Data.
N81-29511/5 1081

SAR Processing on the MPP.
N82-11801/9 1174

IMAGE PROJECTORS
Computer Image Generation: Advanced Visual/Sensor Simulation.
AD-A107 098/6 1172

IMAGE REGISTRATION
Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236

IMAGE RESOLUTION
An Analysis of Haze Effects on Landsat Multispectral Scanner Data.
N81-29497/7 1080

IMAGES
Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236

IMAGING TECHNIQUES
Real-Time 3D X-Ray and gamma-Ray Viewer.
PAT-APPL-6-267 178 1179

IMMOBILIZATION
Participation of the Hypophyseal-Adrenal Cortex System in Thrombin Clearance During Immobilization Stress.
N82-11760/7 1144

IMMUNE RESPONSE
Malnutrition: Immunological Aspects. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859323 1135

IMMUNITY
Trypanosoma congolense: Natural and Acquired Resistance in the Bovine.
AD-A106 952/5 1122

IMMUNIZATION
Inhibition of in vitro Growth of Plasmodium falciparum by Immune Serum from Monkeys.
AD-A106 960/8 1122

IMMUNOLOGIC DISEASES
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IMMUNOLOGY
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PB82-859323 1135

Colostrum: Immunological Aspects. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859588 1135

IMPACT
Energy Impacted Area Development Assistance Program's Designation Criteria.
AD-A106 902/0 1180

Impact Ionization and Hot Carrier Transport in Semiconductors.
AD-A107 386/5 1263

IMPACT POINT
Study of Meteorological Conditions Along Actual or Proposed Reentry Trajectories.
AD-A107 035/8 1273

IMPATT DIODES
Properties of High-Efficiency X-Band GaAs Impatt Diodes.
AD-A107 043/2 1170

IMPORTS
U.S. Laws and Regulations Applicable to Imports from Nonmarket Economies Could be Improved.
AD-A106 878/2 1097

The United States Remains Unprepared for Oil Import Disruptions. Volume I. Summary: Includes Conclusions and Recommendations.
AD-A106 921/0 1180

IMPROVED TIROS OPERATIONAL SATELLITES
Characteristics, of Tiros, Goes, Dmsp and Landsat Systems.
N81-29506/5 1272

IMPURITIES
The Effects of Impurities on the Performance of Silicon Solar Cells.
N82-11548/6 1187

IN-SITU GASIFICATION
Effect of Thermomechanical Properties on Initial Cavity Growth.
DE81030839 1161

Effects of Gas-Flow Pattern on Cavity Shape.
DE82000347 1161

Princetown I Data Analysis.
MLM-2731(OP) 1268

INCENTIVE CONTRACTS
Determination of Contract Suitability to the Award Fee Concept.
AD-A107 465/7 1090

INCENTIVES
Physicians and Financial Incentives,
PB82-133695 1132

INCLUSIONS
Nuclear Materials Research Progress Reports for 1979.
LBL-11030 1249

INCOHERENT SCATTERING
Communications through a Randomly Dispersive Incoherent Optical Channel.
AD-A107 052/3 1233

INCOME
States' Efforts to Detect Duplicate Public Assistance Payments.
AD-A106 846/9 1113

Billions of Dollars are Involved in Taxation of the Life Insurance Industry -- Some Corrections in the Law are Needed.
AD-A106 856/8 1097

Using CWBH Data to Evaluate the Methods Used in the Urban Institute's Simulation Model of Unemployment Insurance Benefits.
PB82-134206 1110

INCOMPRESSIBLE FLOW
Generation of Axi-Symmetric Body Shapes in Subsonic Flow by Means of Polynomial Distributions of Sources and Doublets Along the Axis of Symmetry.
N82-11038/8 1254

INCONEL 706
Thermophysical Properties of Selected Wear-Resistant Alloys.
HEDL-TME-79-6 1192

INCONEL 718
Thermophysical Properties of Selected Wear-Resistant Alloys.
HEDL-TME-79-6 1192

INCONEL ALLOYS
Thermophysical Properties of Selected Wear-Resistant Alloys.
HEDL-TME-79-6 1192

INDEXES (DOCUMENTATION)
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N82-11982/7 1095

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PB82-128257 1109

Natural Hazards Observer Index. Volume 1, Number 1-Volume 4, Number 3.
PB82-132663 1114

INDIAN OCEAN

Supply Workload Implications of Increased Deployment to the Indian Ocean.
AD-A106 994/7 1230

INDIANA

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Indiana, Volume 15, Part 1.
HRP-0903702/9 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Indiana, Volume 15, Part 2.
HRP-0903703/7 1125

Users Manual for the US Baseline Corn and Soybean Segment Classification Procedure.
N81-29504/0 1080

Water Resources Data for Indiana, Water Year 1980.
PB82-135930 1160

INDICATOR SPECIES

Use of Aquatic Oligochaete, 'Lumbriculus variegatus', for Effluent Biomonitoring.
PB82-137621 1136

INDIUM PHOSPHIDES

Liquid-Encapsulated Czochralski Growth of InP Crystals.
AD-A107 051/5 1252

Liquid-Phase Epitaxial Growth of InP and InGaAsP Alloys.
AD-A107 233/9 1252

InGaAsP/InP Laser Development for Single-Mode, High-Data-Rate Communications.
N82-11452/1 1255

INDONESIA

A Preliminary Study in Three Countries: Indonesia Report,
PB82-133232 1114

INDOOR AIR POLLUTION

Development of Fuel Cell Gas Detection Instruments for Use in a Mine Atmosphere.
PB82-137316 1229

High Concentration Dust Monitor.
PB82-139320 1229

Evaluation of Formaldehyde Problems in Residential Mobile Homes.
PB82-144619 1136

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PB82-859978 1203

INDUSTRIAL ACCIDENTS

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PB82-100033 1139

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PB82-100041 1139

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PB82-100058 1139

Prevention of Low Back Injury in the Industrial Work Force: Symposium Held at Cincinnati, Ohio on November 9, 1972,
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INDUSTRIAL BUILDINGS

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PB82-802513 1203

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PB82-107103 1139

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PB82-107178 1139

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PB82-107186 1139

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PB82-107194 1139

Results of Air Samples of Johns-Manville in Marshville, North Carolina.
PB82-107202 1139

Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
PB82-107210 1139

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PB82-107228 1140

Health Hazard Evaluation Report No. HE-80-159-752 at Mountain Bell, Denver, Colorado,
PB82-107236 1140

Chloroacetaldehyde (Analytical Method S11).
PB82-107244 1140

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PB82-859216 1135

INDUSTRIAL PLANTS

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ALO-3985-1 1181

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LA-8137-TASE 1182

INDUSTRIAL SAFETY

Standard Specification for Industrial Safety-Belt Assemblies.
N82-11278/0 1225

Handbook for Industrial Noise Control.
N82-11858/9 1252

INDUSTRIAL STRUCTURE

Future Developments in the Food Industry: Probable Efforts at Vertical Integration by Food Retailers.
PB82-132374 1098

INDUSTRIAL WASTE TREATMENT

Waste Processing and Pollution in the Chemical and Petrochemical Industries. 1978-June, 1980 (Citations from the NTIS Data Base).
PB82-802661 1147

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PB82-802679 1147

INDUSTRIALIZED HOUSING

Industrialized Housing. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802349 1227

INDUSTRIES

Legislative and Regulatory Actions Needed to Deal with a Changing Domestic Telecommunications Industry.
AD-A106 835/2 1102

Billions of Dollars are Involved in Taxation of the Life Insurance Industry -- Some Corrections in the Law are Needed.
AD-A106 856/8 1097

Synthetic Fuels Corporation's Management of Demonstration Projects Would Be Limited.
AD-A106 920/2 1266

National Waterways Study Overview of the Transportation Industry.
AD-A107 366/7 1224

The Impact of Regulation upon Job Design: A Preliminary Study.
PB82-133760 1110

Marketing Practices in the Alcoholic Beverages Industry: Toward an Understanding of How Macro-Environmental Forces Shape Marketing Strategies in the Alcoholic Beverage Industry. A Supplement to Phases I and II,
PB82-138579 1100

A Profile of the Medical Technology Industry and Governmental Policies. Volume I.
PB82-141821 1100

A Profile of the Medical Technology Industry and Governmental Policies. Appendix A: Review and Assessment of Secondary Data Sources for Developing a Profile of the Medical Technology Industry.
PB82-141847 1141

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume II. The Mobile Home Production System,
PB82-144338 1100

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume III: The Mobile Home Distribution System,
PB82-144346 1100

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume IV: The Mobile Home Park System,
PB82-144353 1100

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume V: Public Regulation,
PB82-144361 1100

INDUSTRY

Heat Storage in Ground Water. Part 1. Study of Ground Water Reservoirs.
NE-PROJ-2060591(Pt.1) 1188

Heat Storage in Ground Water. Part 2. Study of Distribution Systems.
NE-PROJ-2060591(Pt.2) 1188

High Temperature Thermal Insulation Usage in UK Process Industries.
NP-1902598 1201

Cogeneration Feasibility Study in the Gulf States Utilities Service Area.
ORNL/SUB-7317/1 1187

Assessment of an Atmospheric Fluidized-Bed Coal-Combustion Gas-Turbine Cogeneration System for Industrial Application.
ORNL/TM-6626/V1 1187

INEQUALITIES

Variable Metric Relaxation Methods. Part I. A Conceptual Algorithm.
AD-A107 461/6 1199

INERT MATERIALS

The Drift, Diffusion, and Reactions of Slow Ions in Gases - O. N. R. Summary Questionnaire.
AD-A107 129/9 1148

INERTIAL CONFINEMENT

Inertial Confinement Fusion Reactor Systems.
LA-UR-80-2499 1239

INERTIAL SURVEYING

Inertial Surveying Technology.
AD-A107 379/0 1157

INERTIAL SYSTEMS

Inertial Surveying Technology.
AD-A107 379/0 1157

INFECTION

Colostrum: Immunological Aspects. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859588 1135

INFECTIOUS DISEASES

A Multidisciplinary Program of Infectious Disease Surveillance along the Transamazon Highway in Brazil: Epidemiology of Arbovirus Infections.
AD-A107 008/5 1123

INFLATING

Development of Automatic Inflation Devices for Life Preservers.
AD-A107 107/5 1140

INFLATION (ECONOMICS)

Effects of Inflation. 1978-November, 1981 (Citations from the NTIS Data Base).
PB82-802380 1102

INFO SYSTEM

INFO: The JHU/APL Information Package.
PB82-121740 1174

INFO: The JHU/APL Information Package Manual.
PB82-121757 1174

INFORMATION PROCESSING

Concerns about HHS' Ability to Effectively Implement Incentive Funding for State Information Systems in the Aid to Families with Dependent Children Program.
AD-A106 871/7 1088

Cerebral Economics: Resource Competition within but not Between Hemispheres.
AD-A107 362/6 1112

INFORMATION RETRIEVAL

Veterans Administration's Efforts to Improve the Management of Paper Records in the Department of Veterans Benefits. A Major System Acquisition Project.
AD-A107 192/7 1095

Selective Inquiry System/Timesharing Retrieval Subsystem.
AD-A107 299/0 1173

Selective Inquiry System (SIS). Operation Manual and Users Manual.
AD-A107 300/6 1173

Computer Program Documentation User Information for the Rso-Tape Print Program (Rsoprnt).
N81-29509/9 1174

The Subject Access Problem - Opportunities for Solution: A Workshop Held at Springfield, Virginia on 18-20 October, 1978.
PB82-134529 1096

INFORMATION SERVICES

The Role of Communications and Information Resources in Canada,
PB82-129057 1235

INFORMATION SYSTEMS

Records Filing, Maintenance and Disposition Study for Department of the Army.
AD-A107 079/6 1094

An Information System for the Peruvian Air Force Hospital.
AD-A107 440/0 1124

Design Methodology and Development History of an ISO OSI Layered Architecture for the Canadian Broadcast Telidon System.
N82-11337/4 1234

ORNL Direct Purchase Information System (DPIS) User's Manual.
ORNL/TM-6428 1090

Patient Tracking for High Blood Pressure Control.
PB82-107525 1130

The Information User in the Construction Industry - A Study of the Educational Need and Provision,
PB82-132648 1096

Methods for Evaluating Costs of Automated Hospital Information Systems.
PB82-134073 1096

Trial of a Computer Generated Travel Information System in Two British Rail Travel Enquiry Bureaux,
PB82-135781 1096

A Reappraisal of the Use of IDMS for the Radcliffe Science Library Serials Handling System,

PB82-136227 1096

American Indian Jobs/Skills Bank.
PB82-144478 1111

INFORMATION TRANSFER
U.S. Technology Transfer to the Soviet Union: A Dilemma.
AD-A107 313/9 1090

INFRARED IMAGERY
Soil Moisture Inferences from Thermal Infrared Measurements of Vegetation Temperatures.
N81-29500/8 1169

INFRARED IMAGES
Digital Filters for Infrared Target Acquisition Sensors.
AD-A107 061/4 1236

Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236

Experimental Investigation of Near Real-Time Interpretation Techniques for Transmitted Imagery.
AD-A107 515/9 1103

Design and Utilization of an Infrared Data Base for an Advanced Image Interpretation Facility.
AD-A107 529/0 1173

INFRARED LASERS
InGaAsP/InP Laser Development for Single-Mode, High-Data-Rate Communications.
N82-11452/1 1255

INFRARED SPECTRA
Time-Resolved Infrared Study of Bimolecular Reactions between Tert-Butly Radicals.
AD-A107 154/7 1148

INFRARED SPECTROSCOPY
Far-Infrared Measurements of Trace Gases.
N82-11698/9 1228

INHIBITORS
Initial Results of In Vitro Studies of Clavulanic Acid Synergism,
PB82-129735 1141

INJECTION
Boosting Up of Neutral Beam Heating Power by Slowly Rising Toroidal Field.
N82-11929/8 1240

INJURIES
Prevention of Low Back Injury in the Industrial Work Force: Symposium Held at Cincinnati, Ohio on November 9, 1972,
PB82-107251 1140

INLET FLOW
A Summary of V/STOL Inlet Analysis Methods.
N82-11043/8 1077

INLETS
Linearized Solution to Inlet Equation with Inertia.
AD-A107 205/7 1156

INLETS (WATERWAYS)
Linearized Solution to Inlet Equation with Inertia. Stability of Rubble Mound Breakwaters. Particle Motion under Stokes Waves.
AD-A107 343/6 1156

INORGANIC SALTS
Thermal Energy Storage Systems. Part I.
PB82-137589 1188

INPUT
Automatic Input Data Generation for ADINA and NASTRAN Structural Computer Codes.
AD-A107 534/0 1262

INPUT/OUTPUT ROUTINES
Computer Program Documentation User Information for the Rso-Tape Print Program (Rsoprnt).
N81-29509/9 1174

COPY3 - Copy Sequential Data Sets.
PB82-121864 1175

INSECT CONTROL
Preserving the Green Sale Value of Dying Ponderosa Pine with Lindane.
PB82-134446 1082

Field Evaluation of Phloem-Mobile Acephate for Suppression of Southern Pine Beetle.
PB82-134479 1082

INSECT REPELLENTS
Primary Dermal Irritation Potential of the Insect Repellent CHF1 and Its Components.
AD-A106 944/2 1144

INSECTICIDES
Biotechnology in Agricultural Research (Biotechnologie in het Landbouwkundig Onderzoek).
PB82-140450 1134

INSECTS
A New Species of 'Stenonema' (Ephemeroptera: Heptageniidae) from Eastern North America.
PB82-132465 1121

INSOLATION
Solar Energy R + D Programme, 1979-1983. Project F: Solar Radiation Data.
EUR-7011-EN 1085

Low-Cost Solar Array Project: Four Absolute Cavity Radiometer (Pyrheliometer) Intercomparisons at New River, Arizona: Radiometer Standards.
N82-11435/6 1228

Stochastic Sun: Understanding the Intermittent Resource.
ORAU/IEA-80-10(M) 1182

INSPECTION
Examination of the Effectiveness of Statutory Offices of Inspector General.
AD-A107 187/7 1089

Standard Specification for Light Ladders.
N82-11277/2 1218

INSTALLATION
AGARD Flight Test Instrumentation Series. Volume 13. Practical Aspects of Instrumentation System Installation,
AD-A107 355/0 1077

INSTRUCTIONAL MATERIALS
NPDES Compliance Monitoring Inspector Training: Overview.
PB82-136342 1214

NPDES Compliance Monitoring Inspector Training: Legal Issues.
PB82-136359 1214

NPDES Compliance Monitoring Inspector Training: Biomonitoring.
PB82-136367 1214

NPDES Compliance Monitoring Inspector Training: Sampling Procedures.
PB82-136375 1214

NPDES Compliance Monitoring Inspector Training: Laboratory Analysis.
PB82-136383 1215

Work Simplification Training Techniques and Materials.
PB82-136458 1110

INSTRUCTORS
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PB82-134263 1110

INSTRUMENT LANDINGS
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AD-A107 397/2 1237

INSTRUMENTATION
Development of Instrumentation for Research Probes.
AD-A107 280/0 1086

INSURANCE
Billions of Dollars are Involved in Taxation of the Life Insurance Industry -- Some Corrections in the Law are Needed.
AD-A106 856/8 1097

Terminating the Audit of the National Flood Insurance Program's Fiscal 1980 Financial Statements.
AD-A107 188/5 1089

INTAKE SYSTEMS
Aerosol Sampling Inlets and Inhalable Particles.
PB82-132473 1212

Investigation of Hydrodynamic and Behavioral Factors That Affect Zooplankton Sampling by Pumps.
PB82-137886 1122

INTEGRAL EQUATIONS
A Study on Numerical Method for Evaluating Spanwise Integral in Subsonic Lifting-Surface Theory.
N82-11035/4 1076

INTEGRATED CIRCUITS
Design Aids for VLSI: The Berkeley Perspective.
AD-A107 019/2 1178

Proton Upsets in LSI Memories in Space.
AD-A107 331/1 1173

MOS Circuits. 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859471 1179

MOS Circuits. 1970-1981 (Citations from the NTIS Data Base).
PB82-859489 1179

INTEGRATED SYSTEMS
IRIG-TIME Synchronized Binary Video Data Inserter.
AD-A107 119/0 1233

Flow Control and Routing Techniques for Integrated Voice and Data Networks,
AD-A107 140/6 1233

INTERFACIAL ENERGY
Universal Binding Energy Relations in Metallic Adhesion.
N82-11183/2 1189

INTERFEROMETERS
Optical Fiber Interferometer for the Study of Ultrasonic Waves in Composite Materials.
N82-11121/2 1191

INTERFEROMETRY
Interferometric Spectrum Analyzer.
AD-A107 015/0 1227

INTERMEDIATE BTU GAS
Industrial Fuel Gas Demonstration Plant Program. Task II Report, Demonstration Plant Process Design. 2ND Issue.
FE-2582-13 1146

INTERNAL COMBUSTION ENGINES
Numerical Simulation of Reactive Flow in Internal Combustion Engines.
LA-UR-80-1633 1271

Combustion Research. Chapter from the Energy and Environment Division Annual Report 1978.
LBL-9809 1209

INTERNATIONAL
Unresolved Issues Remain Concerning U.S. Participation in the International Energy Agency.
AD-A106 879/0 1102

INTERNATIONAL POLITICS
Saudi Perceptions of the International Environment,
AD-A106 927/7 1102

INTERNATIONAL RELATIONS
U.S. Technology Transfer to the Soviet Union: A Dilemma.
AD-A107 313/9 1090

INTERNATIONAL SUN EARTH EXPLORERS
Magnetic Field Investigation for ISEE Mother and Daughter Spacecraft.
N82-11105/5 1228

INTERNATIONAL TRADE
U.S. Technology Transfer to the Soviet Union: A Dilemma.
AD-A107 313/9 1090

Convention on International Trade in Endangered Species of Wild Fauna and Flora; 1979 Annual Report for the United States of America.
PB82-128646 1098

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PB82-134321 1099

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INTERPERSONAL RELATIONS
Interpersonal Relations Among Hispanics in the United States: A Content Analysis of the Social Science Literature.
AD-A107 460/8 1113

INTERPLANETARY MAGNETIC FIELDS
Geomagnetic Observations.
N82-11693/0 1085

INTERPRETERS
Experimental Investigation of Near Real-Time Interpretation Techniques for Transmitted Imagery.
AD-A107 515/9 1103

INVENTORIES
Optimal Control of a Network of Whole Blood Banks: Target Inventory Levels for a Hospital Blood Bank or a Decentralized Regional Blood Banking System.
PB82-106816 1130

INVENTORY
The Navy Must Improve Its Accountability for Conventional Ammunition.
AD-A107 174/5 1230

INVENTORY CONTROL
Conrail Needs to Further Improve Inventory Control and Management.
AD-A106 837/8 1088

INVERTEBRATES
A Study of the Invertebrates and Fishes of Salt Marshes in Two Oregon Estuaries.
AD-A106 973/1 1155

INVISCID FLOW
Steady/Oscillatory, Supersonic/Hypersonic Inviscid Flow Past Oscillating Wings and Wedge Combinations at Arbitrary Angles of Attack.
AD-A107 438/4 1076

IO
The Tides of Io.
PB82-133927 1083

IODATES
Research in Nuclear Chemistry. Progress Report, March 1, 1981-February 28, 1982.
DE81030542 1150

IODIDES
Nuclear Materials Research Progress Reports for 1979.
LBL-11030 1249

IODINATED ALIPHATIC HYDROCARBONS
Studies of Free Radicals by Ultraviolet Excimer Laser Photolysis. Progress Report, 1 April 1981-1 October 1981.
DE82000688 1151

ION BEAMS
Fundamentals of Ion Motion in Electric Radiofrequency Multipole Fields.
AD-A107 243/8 1253

Stability of Intense Transported BEAMS.
LBL-8382 1257

ION BOMBARDMENT
Energy and Angle Resolve SIMS Studies of CO on Ni(001).
AD-A107 474/9 1149

ION CYCLOTRON RADIATION
Least Squares Autoregressive (Maximum Entropy) Spectral Estimation for Fourier Spectroscopy and Its Application to the Electron Cyclotron Emission from Plasma.

N82-11925/6 1261

ION DENSITY
Kink Instabilities in Long Ion Layers.
AD-A107 466/5 1239

ION EXCHANGE RESINS
Ion Exchange Resins. June, 1970-1981 (Citations from the Engineering Index Data Base).
PB82-858994 1154

Zeolites in Radioactive Applications. 1976-1981 (Citations from the Energy Data Base).
PB82-859422 1245

Zeolites in Catalysis. 1976-1981 (Citations from the Energy Data Base).
PB82-859505 1269

ION IMPLANTATION
Processing of Silicon Solar Cells by Ion Implantation and Laser Annealing.
N82-11546/0 1186

ION SOURCES
Ion Beam Propagation in a Filamented Channel.
NRL-MR-4180 1240

ION TEMPERATURE
Boosting Up of Neutral Beam Heating Power by Slowly Rising Toroidal Field.
N82-11929/8 1240

IONIC COLLISIONS
Charge Transfer in Collisions of Li-3(+) And Be-4(+) Ions with Atomic Hydrogen at Low Impact Energy.
N82-11927/2 1152

IONIZATION
Ionization and Aerosol Particulates in the Middle Atmosphere.
AD-A107 361/8 1084

Impact Ionization and Hot Carrier Transport in Semiconductors.
AD-A107 386/5 1263

IONIZING RADIATION
Baseline Study of Effects of Ionizing Radiation on the Chromosomes of the Marine Worm, 'Neanthes arenaceodentata'.
PB82-131517 1143

IONOSONDES
The Effect of Ionospheric Variability on the Accuracy of High Frequency Position Location.
AD-A107 425/1 1237

IONOSPHERIC DISTURBANCES
The Effect of Ionospheric Variability on the Accuracy of High Frequency Position Location.
AD-A107 425/1 1237

IONOSPHERIC MODELS
Empirical F-Region Model Development Based on S3-1 Satellite Measurements,
AD-A107 403/8 1084

IONOSPHERIC PROPAGATION
The Effect of Ionospheric Variability on the Accuracy of High Frequency Position Location.
AD-A107 425/1 1237

A Program to Compute ELF/VLF Earth-Ionosphere Modal Height Gains via WKB Methods up to Satellite Altitudes.
AD-A107 517/5 1264

IONOSPHERIC TRANSMISSION
Accuracy of High Frequency Maximum Usable Frequencies (MUF) Prediction.
AD-A107 097/8 1264

IONS
Odorant Responses of Na(+) -K(+) ATPase Activity by Preparations from Paired Turbinals of Rat Olfactory Tissue.
AD-A107 102/6 1142

Creation and Annihilation of Solitons, Radicals, and Ions in Polyacetylene as Related to the Mechanisms of Isomerization, Doping and Conduction.
AD-A107 122/4 1195

The Drift, Diffusion, and Reactions of Slow Ions in Gases - O. N. R. Summary Questionnaire.
AD-A107 129/9 1148

Soliton Formation and cis trans Isomerization in Polyacetylene.
AD-A107 274/3 1195

IOWA
Passive Design Tutorial.
ISM-227 1201

Users Manual for the US Baseline Corn and Soybean Segment Classification Procedure.
N81-29504/0 1080

IRIDIUM BASE ALLOYS
Metallurgical and Mechanical Properties of Thorium-Doped Ir-0.3% W Alloys.
ORNL-5616 1193

IRON
Temperature Limitations of Alkaline-Battery Electrodes. Part 1. The Electrochemical Kinetic Behavior of Iron, Nickel, and Zinc in Concentrated Sodium Hydroxide Solutions. Final Report.
DE81027235 1187

Neutron-Capture gamma-Ray Analysis of Coal for Sulfur, Iron, Silicon and Moisture.
IS-T-847 1165

High Temperature Sulfidation of Iron and Iron Alloys. 1976-1981 (Citations from the Energy Data Base).
PB82-859240 1193

IRON ALLOYS
Mechanisms of Recovering Low Cycle Fatigue Damage in Incoloy 901.
AD-A107 255/2 1192

The Oxidation and Corrosion Resistance of Nitrided Iron Alloys.
AD-A107 516/7 1192

High Temperature Sulfidation of Iron and Iron Alloys. 1976-1981 (Citations from the Energy Data Base).
PB82-859240 1193

IRON BASE ALLOYS
Weldability of Thermally Grain-Refined Fe-12Ni-0.25Ti for Cryogenic Structural Applications.
LBL-10259 1192

Erosion-Corrosion-Wear Program.
LBL-11109 1192

IRRADIATION
Radiation Testing of Composite Materials, in Situ Versus Ex Situ Effects.
N82-11116/2 1190

IRRADIATION CAPSULES
FFTF MOTA: Design Thermal and Stress Overcheck Analyses.
DE81027367 1247

IRRIGATION
Irrigation Market for Solar Thermal Parabolic Dish Systems.
N82-11549/4 1182

Effect of Irrigation Pumping on the Ground-Water System in Newton and Jasper Counties, Indiana.
PB82-137688 1081

ISLANDS
Recent Geologic History of a Barrier Island.
AD-A107 497/0 1157

ISOCYANIC ACID/METHYLENE-BIS (PHENYL)
Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
PB82-107210 1139

ISOCYANIC ACID/ (METHYLPHENYLENE-ESTER)
Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
PB82-107210 1139

ISOMERIZATION
Soliton Formation and cis trans Isomerization in Polyacetylene.
AD-A107 274/3 1195

Quantum-Mechanical Studies on Chemical Reactivity and Ballistic Chemistry. VII. Semiempirical Molecular Orbital Calculations and Experimental Studies on Relative Chemical Reactivities of Isomeric Tetrazole Derivatives, and their Relationship to the Explosive Properties of some Tetrazole Derivatives.
AD-A107 288/3 1250

Isotope Effect in Gas-Surface Vibrational Energy Transfer. Cyclopropane and Cyclopropane-d6 Isomerization by the VEM Technique.
AD-A107 365/9 1149

ISOPROPANOL
Primary Dermal Irritation Potential of the Insect Repellent CHF1 and Its Components.
AD-A106 944/2 1144

ISOSTATIC PRESSING
Mechanisms of Recovering Low Cycle Fatigue Damage in Incoloy 901.
AD-A107 255/2 1192

ISOTOPE PRODUCTION
Mound Facility Activities in Chemical and Physical Research: July-December 1979.
MLM-2827 1240

ISOTOPES
Vibrational Spectra of Oxygen- and Boron-Isotopically Substituted B2O3 Glasses.
AD-A107 333/7 1189

ISOTROPIC TURBULENCE
Mixing of a Passive Scalar in Isotropic and Sheared Homogeneous Turbulence.
N82-11394/5 1254

ISX TOKAMAK
High-beta Studies with Beam-Heated, Non-Circular Plasmas in ISX-B.
DE81032003 1239

JEMEZ MOUNTAINS
Water Quality in the Vicinity of Fenton Hill Site, 1978. Progress Report.
LA-8217-PR 1136

JET AIRCRAFT NOISE
SEL and EPNL Noise Duration Coefficients for the 747 and T-38 Aircraft.
N82-11860/5 1078

JET ENGINE FUELS
Symposium on Commercial Aviation Energy Conservation Strategies, April 2-3, 1981. Papers and Presentations.
AD-A107 106/7 1181

Development of Catalytic Systems for the Conversion of Syngas to Jet Fuel and Diesel Fuel and Higher Alcohols. Annual Report.
DE82000067 1151

Experimental Study of Fuel Heating at Low Temperatures in a Wing Tank Model, Volume 1.
N82-11224/4 1268

JET ENGINE NOISE
Design and Fabrication of Coanda Suppressor Flow Visualization Model,
AD-A107 436/8 1270

JET FLOW
The Design of a 'Jet Catcher'.
AD-A106 968/1 1253

A Study of Wall Jets and Tangentially Blown Wings.
AD-A106 986/3 1077

A Study of the Interactions between Large-Scale Coherent Structures and Fine-Grained Turbulence in a Round Jet.
AD-A106 993/9 1253

JET IMPINGEMENT
Jet Impingement Heat Transfer Enhancement for the GPU-3 Stirling Engine.
N82-11993/4 1271

JET LAG
When the Grand Tour's a Grind,
AD-A106 818/8 1143

JINR SYNCHROTRON
JINR Synchrophasotron Operation and Improvement (The Second Quarter of 1978).
JINR-9-11990 1257

JOB ANALYSIS
Avionic Communications and Avionic Navigation Systems Specialties AFS 328X0 and 328X1.
AD-A107 115/8 1107

The Impact of Regulation upon Job Design: A Preliminary Study.
PB82-133760 1110

JOB TRAINING
Department of Labor Needs to Give CETA Prime Sponsors More Guidance and Assistance for Implementing Monitoring Requirements.
AD-A106 847/7 1105

JOINING
Sheet Metal Joining: Nonferrous Alloys. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
PB82-858804 1222

Sheet Metal Joining: Nonferrous Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-858812 1223

Sheet Metal Joining: Ferrous Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-858903 1223

Sheet Metal Joining: Ferrous Alloys. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
PB82-858911 1223

JOINTS (ANATOMY)
Isometric, Isotonic, and Isokinetic Torque Variations in Four Muscle Groups through a Range of Joint Motion,
AD-A107 324/6 1142

JOINTS (JUNCTIONS)
Reproducibility of Joint Spacing Measurements in Rock,
PB82-135344 1159

JUAN DE FUCA STRAIT
Marine Bird Populations of the Strait of Juan de Fuca, Strait of Georgia and Adjacent Waters in 1978 and 1979,
PB82-132622 1155

Circulation and Trajectory Calculations in the Eastern Strait of Juan de Fuca Using a CODAR System,
PB82-134099 1156

JUDGEMENT (PSYCHOLOGY)
Spatial Learning and Reasoning Skill.
AD-A107 345/1 1112

Integration of Theory and Research in Judgment and Decision Making.
AD-A107 385/7 1112

JUPITER (PLANET)
Voyager Observations of Jupiter's Distant Magnetotail.
AD-A107 126/5 1082

Determination of Jupiter's Electron Density Profile from Plasma Wave Observations.
AD-A107 127/3 1082

K RESONANCES
Meson F sub 1 Spin and Parity Measurement.
LPNHEP-T-78-01 1260

KANSAS
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kansas, Volume 16, Part 1.
HRP-0903704/5 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kansas, Volume 16, Part 2.
HRP-0903705/2 1126

Evaluation of Gravimetric Ground Truth Soil Moisture Data Collected for the Agricultural Soil Moisture Experiment, 1978 Colby, Kansas, Aircraft Mission.
N81-29494/4 1169

KAON BEAMS
Monochromatic Neutral Kaon Beam.
LA-8444-MS 1257

KAONS
Weak and Electromagnetic Characteristics of Pseudoscalar Mesons in the Nonlocal Quark Model.
JINR-R-4-12509 1259

KEHRS MILL TRAIL UPPER DAM
National Dam Safety Program. Kehr's Mill Trail Upper Dam (MO 11636), Missouri - Kansas City Basin, St. Louis County, Missouri. Phase I Inspection Report.
AD-A107 487/1 1208

KENTUCKY
Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Kentucky, Virginia, and West Virginia: Jenkins Quadrangle. Final Report.
GJBX-92(80)(V.2F) 1165

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kentucky, Volume 17, Part 1.
HRP-0903706/0 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kentucky, Volume 17, Part 2.
HRP-0903707/8 1126

The Cooperative Coal Marketing Arrangement in Eastern Kentucky: A Feasibility Report.
PB82-107327 1098

KERNEL FUNCTIONS
A Computer Solution to the Stationary Navier-Stokes Equations in Two Dimensions with Proven Convergence.
N82-11398/6 1254

KEROGEN
Investigation of Factors Affecting the in-Situ Combustion Retorting of Oil Shale. Final Report.
DE82000482 1161

KILNS
Energy Efficient Lumber Dry Kiln Using Collectors and Refrigeration System.
PAT-APPL-6-276 764 1196

KINETIC ENERGY
The Design of a 'Jet Catcher'.
AD-A106 968/1 1253

An Energy Integral and Variational Principle for Plasma Kinetic Modes.
N82-11926/4 1261

KIRK LAKE DAM
National Dam Safety Program. Kirk Lake Dam (Inventory Number N.Y. 682), Lower Hudson River Basin, Putnam County, New York. Phase I Inspection Report,
AD-A107 408/7 1206

KNUDSEN FLOW
Diffusion of Gases in Capillaries.
DE82000267 1253

KODIAK ARCHIPELAGO
Distribution and Abundance of Marine Birds and Mammals Wintering in the Kodiak Area of Alaska.
PB82-140187 1155

KOREA
Terminal Forecast Reference Notebook, Camp Casey, Korea.
AD-A107 432/7 1086

Terminal Forecast Reference Notebook, Osan AB, Korea.
AD-A107 433/5 1086

LA FOLLETTE (TENNESSEE)
Floods on Big Creek in the Vicinity of La Follette, Tennessee.
PB82-128711 1211

LABELS
Label Utility System.
PB82-121831 1095

Label Utility System.
PB82-121849 1095

LABOR
Issues Related to the Longshoremen's and Harbor Workers' Compensation Act.
AD-A107 193/5 1108

Labor Market Projections Model: A User's Guide to the Population, Labor Force, and Unemployment Projections Model at Lawrence Berkeley Laboratory.
LBL-11349 1097

LABOR RELATIONS
Digest of Labor Arbitration Awards in the Federal Service (Supplement No. 10).
PB82-128257 1109

LABORATORY BUILDINGS
Proceedings: Utilities Operations Seminar.
MLM-MU-80-62-0001 1182

LABORATORY EQUIPMENT
User's Manual for Factor-Jump Thermogravimetry Apparatus, and Associated Programs, Including a General Plotting Program,
PB82-109851 1229

LABRADOR CURRENT
Oceanography of the Grand Banks Region of Newfoundland, March 1974 - October 1974.
AD-A107 452/5 1169

LACTIC DEHYDROGENASE
An Analysis of the Isoenzymes of Creatine Phosphokinase and Lactic Dehydrogenase in the Esophagus.
AD-A107 101/8 1120

LACTONES
Chemistry of Aryloxazolines. Applications to the Synthesis of Lignan Lactone Derivatives.
AD-A107 224/8 1147

LADDERS
Standard Specification for Light Ladders.
N82-11277/2 1218

LAKE CARMEL DAM
National Dam Safety Program. Lake Carmel Dam (Inventory Number N.Y. 100), Lower Hudson River Basin, Putnam County, New York. Phase I Inspection Report,
AD-A107 418/6 1207

LAKE CASSE DAM
National Dam Safety Program. Lake Casse Dam (Inventory Number N.Y. 1156), Lower Hudson River Basin, Putnam County, New York. Phase I Inspection Report.
AD-A107 405/3 1206

LAKE HURON
Mitigation of Shore Damage Attributed to the Federal Navigation Structures at Port Sanilac Harbor, Michigan.
AD-A106 933/5 1204

LAKE LINCOLNDALE DAM
National Dam Safety Program. Lake Lincolndale Dam (Inventory Number N.Y. 102), Lower Hudson River Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 421/0 1208

LAKE MEMPHREMAGOG
Lake Memphremagog-St. Francis River Basin Overview.
PB82-108101 1160

LAKE WAVES
Evergreen Point Bridge Maintenance Problems, 1980.
PB82-128489 1210

Evergreen Point Bridge Maintenance Problems, 1977.
PB82-128505 1211

LAMINAR BOUNDARY LAYER
Amplified Crossflow Disturbances in the Laminar Boundary Layer on Swept Wings with Suction.
N82-11391/1 1078

LAMINATES
An Improved Transverse Shear Deformation Theory for Laminated Antisotropic Plates.
N82-11488/5 1262

LAND
Real Estate Surveys, Studies, and Statistics. 1970-1981 (Citations from the NTIS Data Base).
PB82-859547 1102

LAND MINE WARFARE
Mine/Countermine Problems During Winter Warfare.
AD-A107 047/3 1231

LAND OWNERSHIP
State Laws Relating to the Ownership of U.S. Land by Aliens and Business Entities.
PB82-135211 1099

LAND RECLAMATION
Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000817 1244

An Assessment of Wetland Habitat Establishment at a Central Florida Phosphate Mine Site.
PB82-130808 1211

Coal Surface Mining Reclamation and Fish and Wildlife Relationships in the Easten United States. Volume I: Past Findings, the Surface Mining Law of 1977 (P.L. 95-87), Planning and Management Considerations, and Information Sources.
PB82-130816 1211

Coal Surface Mining Reclamation and Fish and Wildlife Relationships in the Eastern United States. Volume II: Opportunities and Approaches for Fish and Wildlife Planning and Management in Coal Surface Mining, Reclamation and Postmining Land Uses.
PB82-130824 1211

LAND TRANSPORTATION
Transportation Contingency Plans for Future Gas Shortages will not Meet Commuter Needs.
AD-A106 826/1 1179

National Waterways Study Overview of the Transportation Industry.
AD-A107 366/7 1224

LAND USE
Federal Land Acquisition and Management Practices.
AD-A106 834/5 1203

Evaluation of Multiband, Multitemporal, and Transformed Landsat Mss Data for Land Cover Area Estimation.
N81-29496/9 1080

Evaluation of Large Area Crop Estimation Techniques Using Landsat and Ground-Derived Data.
N81-29511/5 1081

An Evaluation of the Spatial Resolution of Soil Moisture Information.
N82-11513/0 1170

Radar Mapping, Archaeology, and Ancient Land Use in the Maya Lowlands.
N82-11514/8 1104

DOD Can Increase Revenues Through Better Use of Natural Resources It Holds in Trust.
PB82-134040 1213

Urban Infill: Opportunities and Constraints.
PB82-144304 1216

Remote Sensing Applied to Urban and Regional Planning. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802562 1217

LANDING IMPACT
Limiting Payload Deceleration during Ground Impact,
AD-A107 371/7 1251

LANDSAT SATELLITES
Characteristics, of Tiros, Goes, Dmsp and Landsat Systems.
N81-29506/5 1272

LANGMUIR WAVES
Parametric Interaction and Spatial Collapse of Beam-Driven Langmuir Waves in the Solar Wind.
AD-A107 217/2 1082

LANGUAGE TRANSLATION
Inquiry Concerning Denial of Contracts to Low Offeror for Army Translation Services.
AD-A106 894/9 1086

LARCHWOOD LAKE DAM
National Dam Safety Program. Larchwood Lake Dam (Inventory Number NY 727), Susquehanna River Basin, Otsego County, New York. Phase I Inspection Report,
AD-A107 412/9 1207

LARGE AREA CROP INVENTORY EXPERIMENT
Evaluation of Large Area Crop Estimation Techniques Using Landsat and Ground-Derived Data.
N81-29511/5 1081

LARGE SPACE STRUCTURES
Technology for Large Space Systems: A Special Bibliography.
N82-11093/3 1272

Nonparametric Identification of a Class of Nonlinear Close-Coupled Dynamic Systems.
N82-11098/2 1272

Parameter Estimation of Large Flexible Aerospace Structures with Application to the Control of the Maypole Deployable Reflector.
N82-11099/0 1272

On the Shape and Orientation Control of an Orbiting Shallow Spherical Shell Structure.
N82-11100/6 1272

Study of Electrical and Chemical Propulsion Systems for Auxiliary Propulsion of Large Space Systems. Volume 1: Executive Summary.
N82-11110/5 1271

Study of Electrical and Chemical Propulsion Systems for Auxiliary Propulsion of Large Space Systems, Volume 2.
N82-11111/3 1271

Study of Foldable Elastic Tubes for Large Space Structure Applications, Phase 3.
N82-11493/5 1273

LASER APPLICATIONS
Laser Induced Fluoroescence from Algae: Results of a Ship-Borne Field Test.
N82-11758/1 1121

LASER BEAMS
Proceedings of the Fourth Laser Hydrography Symposium 30 September - 3 October 1980 at Defence Research Centre, Salisbury, South Australia and Royal Australian Navy Hydrographic Office, North Sydney, New South Wales.
AD-A107 080/4 1168

Evaluation of Spatial Filtering as a Means for Increasing Optical Performance in High Power Beam Trains.
AD-A107 164/6 1256

Laser Photoacoustic Technique for NDE.
AD-A107 388/1 1228

LASER CAVITIES
Fiber-Coupled External-Cavity Semiconductor High-Power Laser.
AD-A107 227/1 1255

LASER COMMUNICATIONS
Device Development Program for Efficient Excitation of a Blue-Green Laser.
AD-A107 073/9 1255

LASER FUSION REACTORS
Development of Fluorides for High Power Laser Optics. Final Report, 1 April 1978-31 March 1980.
NVO-1555-5 1255

LASER INDUCED FLUORESCENCE
Two-Photon Laser-Induced Fluorescence in Oxygen and Nitrogen Atoms.
AD-A107 017/6 1148

KEYWORD INDEX

LASER MATERIALS
The Development of a High Average Power Glass Laser Source.
AD-A107 527/4 1255

LASER MIRRORS
Single-Point Diamond-Turned Mirror Performance Before and after Polishing.
LA-UR-79-2059 1256

LASER MODES
InGaAsP/InP Laser Development for Single-Mode, High-Data-Rate Communications.
N82-11452/1 1255

LASER-PRODUCED PLASMA
Photoemulsion Method Application for Investigation of Plasma Neutron Radiation.
NIIEFA-K-0357 1261

LASER PUMPING
Communications: Fiber-Coupled External Cavity Semiconductor Laser.
AD-A107 301/4 1256

Fluorescent Glasses for Use in Fluorescently Pumping Nd 3(+) Doped Laser Glass.
AD-A107 503/5 1255

LASER-RADIATION HEATING
Laser-Matter Interaction.
AECL-6343 1260

LASER SPECTROSCOPY
Project Group for Laser Research. PLF Annual Report, 1978.
LA-tr-79-46 1255

LASER TARGETS
X-Ray Backlighting Requirements for the Double-Shell Target.
DE81000241 1239

LASERS
Bibliography of Soviet Laser Developments, Number 27, January - February 1977.
AD-A107 304/8 1255

Bibliography of Soviet Laser Developments, Number 26, October - December 1976.
AD-A107 305/5 1255

Bibliography of Soviet Laser Developments, Number 28, March - April 1977.
AD-A107 306/3 1255

A 10.6 micrometer Amplitude Modulated Telemeter Laser with Nonlinear Postdetection: Study of a Single Laser System--Translation.
AD-A107 475/6 1256

LASL
Study of the Nocturnal Drainage Flow over a Sloping Plateau in North-Central New Mexico.
DE81028744 1087

Nuclear Waste Management Technology Development Activities. Progress Report, January-December 1978.
LA-7921-PR 1244

Accelerator Technology Program. Progress Report, April-December 1978.
LA-8350-PR 1257

LATE STARS
Density Sensitive C II Lines in Cool Stars of Low Gravity.
PB82-133885 1083

LATERAL CONTROL
The Effects of Lateral Aerodynamic Uncertainties on the Handling Qualities of the Space Shuttle Orbiter at Mach Numbers of 1.5 and .6.
N82-11051/1 1272

LATHES
Design Analysis for the Control and Drive Retrofit of a Numerically Controlled Lathe.
LA-UR-80-821 1224

LATTICE DYNAMICS
Laser-Stimulated Molecular Dynamics and Rate Processes.
AD-A107 246/1 1149

LATTICE GASES
New Generating Functions and Results for the Density Polynomials of the Lattice Gas.
PB82-137365 1263

LAW ENFORCEMENT OFFICERS
Fewer Agent Transfers Should Benefit the FBI and Its Agents as Well as Save Money.
AD-A107 183/6 1107

LAW (JURISPRUDENCE)
An Analysis of the Scope of Federal Laws and Regulations Controlling Exposures to Substances Which Cause Occupational Respiratory and Pulmonary Diseases.
PB82-134198 1103

State Laws Relating to the Ownership of U.S. Land by Aliens and Business Entities.
PB82-135211 1099

LAWRENCE BERKELEY LABORATORY
Annual Environmental Monitoring Report of the Lawrence Berkeley Laboratory, 1979.
LBL-11192 1246

LAYERS
Effects of a Thin SiO2 Layer on the Formation of Metal-Silicon Contacts.
AD-A107 121/6 1263

LEAD
Survey of Matrix Materials for Solidified Radioactive High-Level Waste.
DE82000706 1244

Influence of Grain Size on the Determination of Heavy Elements by the gamma-gamma Method.
INT-101/I 1151

LEAD ACID BATTERIES
Lead Batteries. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802760 1188

LEAD ORES
Influence of Grain Size on the Determination of Heavy Elements by the gamma-gamma Method.
INT-101/I 1151

LEAD TELLURIDES
Development of MBE Grown Pb-Salt Semiconductor Lasers for the 8.0 to 15.0 Micrometer Spectral Region.
N82-11453/9 1255

LEADING EDGES
Icing Tunnel Tests of a Composite Porous Leading Edge for Use with a Liquid Anti-Ice System.
N82-11052/9 1078

LEARNING
Technical Communication--Taking the User into Account.
AD-A107 030/9 1107

Spatial Learning and Reasoning Skill.
AD-A107 345/1 1112

LEASING
Improvements in Department of the Interior Leasing of Potential Aluminum Resources Are Necessary for More Timely Decisionmaking.
AD-A106 886/5 1191

LEAST SQUARES METHOD
Least Squares Autoregressive (Maximum Entropy) Spectral Estimation for Fourier Spectroscopy and Its Application to the Electron Cyclotron Emission from Plasma.
N82-11925/6 1261

LEATHERWOOD CREEK NUMBER 5 DAM
National Dam Safety Program. Leatherwood Creek Number 5 (Inventory Number VA 08902), Roanoke River Basin, Henry County, Virginia. Phase I Inspection Report.
AD-A107 416/0 1207

LEED (LOW ENERGY ELECTRON DIFFRACTION)
The Adsorption of NO on Ni (111): An ESDIAD/LEED Study.
PB82-137373 1153

LEGAL SERVICES
Real Estate Closing Costs: Real Estate Settlement Procedures Act (RESPA), Section 14a. Volume I: Executive Summary.
PB82-144999 1101

LEGISLATION
Special Estate Tax Provisions for Farmers Should be Simplified to Achieve Fair Distribution of Benefits.
AD-A106 857/6 1102

FERC Should Improve the Natural Gas Well Determination Process.
AD-A106 859/2 1265

Burdensome and Unnecessary Reporting Requirements of the Public Utility Regulatory Policies Act Need to be Changed.
AD-A106 904/6 1180

The United States Synthetic Fuels Corporation's Project Selection Guidelines Need Clarification.
AD-A107 184/4 1266

Comments on Interior's Surface Mining Regulations.
AD-A107 185/1 1161

Issues Related to the Longshoremen's and Harbor Workers' Compensation Act.
AD-A107 193/5 1108

Implementation of Subcontracting Provisions of Public Law 95-507 within Air Force Logistics Command and Air Force Systems Command.
AD-A107 450/9 1090

Real Estate Closing Costs: Real Estate Settlement Procedures Act (RESPA), Section 14a. Volume I: Executive Summary.
PB82-144999 1101

LEISHMANIA
In vivo and in vitro Localization of Leishmania within Macrophage Phagolysosomes: Use of Colloidal Gold as a Lysosomal Label.
AD-A106 956/6 1122

LENS ANTENNAS
Space-Based Radar Array System Simulation and Validation.
AD-A106 996/2 1238

LEPTON REACTIONS
Deep Inelastic Lepton-Nucleus Scattering.
JINR-E-2-12127 1258

LESOTHO
Profiles of Basotho Farmers. Part I: Images of Basotho Farmers. Part II: Are the Basotho Subsistence Farmers. Part III: Progressive Farmers in Lesotho.
PB82-132762 1109

Catalog of Holdings and Other References in the Lesotho MOA/LASA Library.
PB82-133133 1096

LEVITATION
Gas Levitator and Method for Containerless Processing.
PAT-APPL-6-297 486 1224

LIBRARIES
Programming Support Library (PSL).
AD-A107 248/7 1172

LIBRARY AUTOMATION
A Reappraisal of the Use of IDMS for the Radcliffe Science Library Serials Handling System,
PB82-136227 1096

LIBRARY NETWORKS
The Subject Access Problem - Opportunities for Solution: A Workshop Held at Springfield, Virginia on 18-20 October, 1978.
PB82-134529 1096

LICENSES
Permit Fee Guideline.
PB82-107871 1210

LIE ALGEBRAS
PR-Algebras.
JINR-R-5-11595 1197

LIE GROUPS
PR-Algebras.
JINR-R-5-11595 1197

LIFE JACKETS
Development of Automatic Inflation Devices for Life Preservers.
AD-A107 107/5 1140

LIFT
A Study of Wall Jets and Tangentially Blown Wings.
AD-A106 986/3 1077

A Study on Numerical Method for Evaluating Spanwise Integral in Subsonic Lifting-Surface Theory.
N82-11035/4 1076

LIGHT DUTY VEHICLES
Directory of Information for Dynamometer Testing of 1979-1981 Light Duty Motor Vehicles,
PB82-106873 1221

LIGHTWATER REACTORS
LWR Pressure Vessel Irradiation Surveillance Dosimetry.
NUREG/CR-1241-V4 1246

LIGNITE
Coal Combustion in High Convective Flows. Progress Report, March 1, 1981-August 31, 1981.
DE81030391 1265

LIMITERS
The Use of Output Moments to Predict Performance of Nonlinear Systems with Gaussian Inputs.
AD-A106 905/3 1178

LIMNOLOGY
Bottom Heat Transfer to Water Bodies in Winter.
AD-A106 977/2 1159

LINEAR ACCELERATORS
Preliminary Simulation Studies of Accelerator Cavity Loading.
LA-8405-MS 1257

LINEAR ALGEBRA
Linearization of the Water Sorption Isotherm for Homogeneous Ingredients Over aw 0.30 - 0.95.
AD-A107 160/4 1149

LINEAR PROGRAMMING
Variable Metric Relaxation Methods. Part I. A Conceptual Algorithm.
AD-A107 461/6 1199

LINEAR SYSTEMS
Nonparametric Identification of a Class of Nonlinear Close-Coupled Dynamic Systems.
N82-11098/2 1272

LIPID METABOLISM
Effects of Exercise Training on Lipid and Carbohydrate Metabolism in Hemodialysis Patients.
PB82-137860 1134

LIPIDS
Selected Aspects of Cancer-Related Proteins, Carbohydrate, Lipid, and Other Biochemistry.
PB81-929905 1120

LIQUID ATOMIZATION
Improved Constant-Output Atomizer.
PAT-APPL-6-308 203 1225

LIQUID CHROMATOGRAPHY
Determination of N-Methyl Pyridinium-2-Aldoxime Chloride and Its Hydrolytic By-Products by Ion-Pair High-Performance Liquid Chromatography.
AD-A106 962/4 1141

LIQUID OXYGEN
Liquid Oxygen Turbopump Technology.
N82-11468/7 1225

LIQUID PHASE EPITAXY
InGaAsP/InP Laser Development for Single-Mode, High-Data-Rate Communications.
N82-11452/1 1255

LIQUID PHASES
Liquid-Phase Epitaxial Growth of InP and InGaAsP Alloys.
AD-A107 233/9 1252

LIQUID WASTES
Determination of Polychlorinated Biphenyls in Waste and Lubricating Oils.
PB82-133950 1153

Survey of On-Going and Completed Remedial Action Projects.
PB82-134115 1213

LISTINGS
Selected Aspects of Cancer-Related Proteins, Carbohydrate, Lipid, and Other Biochemistry.
PB81-929905 1120

LITERATURE SURVEYS
Developments in Discrete Distributions 1969-1980.
AD-A106 931/9 1196

LITHIUM
Charge Transfer in Collisions of Li-3(+) And Be-4(+) Ions with Atomic Hydrogen at Low Impact Energy.
N82-11927/2 1152

LITHIUM COMPOUNDS
Study of the Two-Photon Photorefractive Effect in Lithium Niobate,
AD-A107 493/9 1256

LITHIUM FLUORIDES
Development of Fluorides for High Power Laser Optics. Final Report, 1 April 1978-31 March 1980.
NVO-1555-5 1255

LITHIUM ISOTOPES
Mound Facility Activities in Chemical and Physical Research: July-December 1979.
MLM-2727 1240

LITHIUM PHOSPHATES
Aqueous Dissolution of Calcium Metaphosphate Glasses.
DE81030130 1189

Behavior of Alkali Metal-Acid Phosphates During Elevated Temperature Water Electrolysis.
DE82000243 1267

LITHOGRAPHY
High-Speed Laser Platemaking from Digital Data for the Defense Mapping Agency.
AD-A107 380/8 1156

LITHOLOGY
Geologic Considerations in Underground Coal Mining System Design.
N82-11516/3 1166

LITHOSPHERE
Study of the Time Evolution of the Lithosphere.
N82-11696/3 1157

LIVER
Orthoplasty for Bile Duct Stricture at the Liver Hilum, A Preliminary Report of 5 Cases,
PB82-129727 1131

LMFBR TYPE REACTORS
Blowdown Transients and Implication for Leak Protection Shutdown Strategy.
DE81027453 1247

Optimization of Radially Heterogenous 1000-MW(E) LMFBR Core Configurations. Appendix C. Research Project 620-25.
EPRI-NP-1000(V.3) 1247

Computational Methods for LMFBR Whole-Core Accident Analysis.
LA-UR-80-1459 1247

LOADER ROUTINES
Patch Macro and Load Module (IRSPATCH).
PB82-121765 1174

LOADING ROUTINES
On-Lining an SDK-85 Microcomputer with a DEC System 10 for Down-Line Loading of Microcomputer Programs,
PB82-134776 1176

LOADS (FORCES)
A Fracture Limit Diagram for Determining Hydrogen Embrittlement of Sheet under Multiaxial Loading Conditions.
AD-A107 116/6 1191

LOANS
Veterans Administration Education Loan Program Should be Terminated: Legislative Action Taken.
AD-A106 845/1 1105

An Evaluation of Farmers Home Administration's Economic Emergency Loan Program Objectives to Determine the Programs Effectiveness and the Need for the Program.
PB82-134727 1092

LOCAL GOVERNMENT
Options for Establishing an Energy Conservation Consolidated Grant Program.
AD-A106 919/4 1180

State-Local Policy Management Project.
PB82-125907 1091

Technological Innovation and Problem-Solving in Local Government: An Assessment of Current Research Methods.
PB82-128620 1091

Technological Innovation and Problem-Solving in Local Government: An Assessment of Current Research Methods, Executive Summary.
PB82-128638 1091

Future of State and Local Pensions.
PB82-144494 1111

Municipal Energy Initiatives in the Northeast,
PB82-144569 1184

Three Major Issues Influencing Local Financial Management Capacity: The Perspective of Mayors.
PB82-144577 1217

National Association of Counties' Report on Local Government's Priority Needs for Financial Management Capacity Sharing.
PB82-144593 1217

Training in Local Government Financial Management Practices. A Supplement to Volume V Trainer's Resource Service (TRS) Catalog of Resources.
PB82-144924 1094

Grantee Budgeting for Federal and State Aid, Part 1: General Findings and Policy Options,
PB82-144957 1094

Grantee Budgeting for Federal and State Aid, Part 2: Jurisdictional Practices,
PB82-144965 1094

Management Improvement Needs of Disadvantaged Communities.
PB82-144973 1094

Management Improvement Needs of Local Manager Governments: A Final Report.
PB82-144981 1094

LOFT REACTOR
LOFT Monthly Progress Report, May 1980.
EGG-LO-MR-007 1247

LOGISTICS MANAGEMENT
The Navy Must Improve Its Accountability for Conventional Ammunition.
AD-A107 174/5 1230

An Evaluation of Spares Acquistion Integrated with Production,
AD-A107 279/2 1231

Aviation Materiel Combat Ready In-Country (AMCRIC).
AD-A107 451/7 1231

LOGISTICS PLANNING
Depot Support of Gas Turbine Engines.
AD-A107 141/4 1230

FAA's Communications Equipment Replacement Plans.
AD-A107 186/9 1233

Aviation Materiel Combat Ready In-Country (AMCRIC).
AD-A107 451/7 1231

LOGISTICS SUPPORT
Supply Workload Implications of Increased Deployment to the Indian Ocean.
AD-A106 994/7 1230

Wartime Requirements for Ammunition Materiel and Personnel (WARRAMP). Volume I. Materiel Postprocessor User's Manual.
AD-A107 076/2 1232

Depot Support of Gas Turbine Engines.
AD-A107 141/4 1230

Forecast of the Second Destination Transportation Tonnage for the Air Force.
AD-A107 235/4 1230

LOGIT MODELS
POLO2: A User's Guide to Multiple Probit or LOgit Analysis.
PB82-134487 1198

LONG POND NUMBER 3 DAM
National Dam Safety Program. Long Pond Dam Number 3 (Inventory Number NY 115), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 410/3 1207

LONG TERM CARE
Design of an Evaluation of PSRO Long-Term Care Review.
PB82-131616 1132

LONG TERM EFFECTS
Evaluation of the Effects of Solar Radiation on Glasses.
N82-11207/9 1256

Survey on Aging on Electrodes and Electrocatalysts in Phosphoric Acid Fuel Cells.
N82-11545/2 1186

Cyclic Nucleotides in Tissues During Long-Term Hypokinesia.
N82-11757/3 1144

LOSS OF COOLANT
TRAC Posttest Calculations of Semiscale Test S-06-3.
LA-UR-80-716 1247

LOUISIANA
Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Shreveport Quadrangle of Louisiana. Final Report.
GJBX-151(80) 1162

Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Alexandria Quadrangle of Louisiana and Texas. Final Report.
GJBX-152(80) 1162

Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Jackson Quadrangle of Mississippi and Louisiana. Final Report.
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Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Hattiesburg Quadrangle of Mississippi, Alabama, and Louisiana. Final Report.
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Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Louisiana, Volume 18, Part 1.
HRP-0903708/6 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Louisiana, Volume 18, Part 2.
HRP-0903709/4 1126

Water Resources Data for Louisiana, Water Year 1980. Volume 3: Coastal Louisiana.
PB82-129305 1160

LOW BTU GAS
Fuel Gas Demonstration Plant Program: Small-Scale Industrial Project. Demonstration Plant Design Manual, Phase I.
COO-5066-T12(V.1) 1145

EDS Coal-Liquefaction Process Development. Supplemental FLEXICOKiNG/Sup SM/ Development Program. Monthly Technical Progress Report, March 1-March 31, 1981.
DOE/ET/10069-T7(V.2) 1146

High-Temperature-Staged Fluidized-Bed Combustion (HITS), Bench Scale Experimental Test Program Conducted During 1980. Final Report.
DOE/ET/15167-191 1265

LOW COSTS
Investigation for Low-Cost Permanent Magnets.
AD-A107 392/3 1171

LOW DOSE IRRADIATION
Spermatogonial Stem Cell Renewal Following Irradiation.
LBL-10109 1143

LOW ENERGY
Symmetry Extinction of LEED Beams for Naphthalene Adsorbed on Pt(iii).
AD-A106 963/2 1148

The Nature of the Phase Transition Observed for Monolayers of Azulene on Pt(III).
AD-A107 067/1 1148

LOW GRAVITY MANUFACTURING
Gas Levitator and Method for Containerless Processing.
PAT-APPL-6-297 486 1224

LOW-HEAD HYDROELECTRIC POWER PLANTS
Support Services for Commercialization of Small Hydroelectric Facilities in North Carolina.
NCEI-0018 1186

LOW INCOME GROUPS
Housing Deprivation Among Enrollees in the Housing Allowance Demand Experiment,
PB82-144411 1115

LOW-LEVEL RADIOACTIVE WASTES
Low-Level Transuranic Waste Assay by Photon Interrogation and Moderated Neutron Counting.
LA-7857 1244

LOW SPEED STABILITY
Effects of Vortex Flaps on the Low-Speed Aerodynamic Characteristics of an Arrow Wing.
N82-11013/1 1077

Wind-Tunnel Results for a Modified 17-Percent-Thick Low-Speed Airfoil Section.
N82-11033/9 1076

LOW TEMPERATURE ENVIRONMENTS
Experimental Study of Fuel Heating at Low Temperatures in a Wing Tank Model, Volume 1.
N82-11224/4 1268

LSI (LARGE SCALE INTEGRATION)
Proton Upsets in LSI Memories in Space.
AD-A107 331/1 1173

LUBRICANTS
Determination of Sample Container Effects on Wearmetals Concentration in MIL-L-7808 Synthetic Lubricant Analyzed on an A/E35U-3 Fluid Analysis Spectrometer.
AD-A107 323/8 1194

LUBRICATING OILS
Determination of Polychlorinated Biphenyls in Waste and Lubricating Oils.
PB82-133950 1153

LUBRICATION
Lubrication and Wear Resistance of Dynamic Seals. 1973-November, 1981 (Citations from the BHRA Fluid Engineering Data Base).
PB82-856584 1189

LUMBER
Energy Efficient Lumber Dry Kiln Using Collectors and Refrigeration System.
PAT-APPL-6-276 764 1196

Forest Policy Project Module III-A: Timber Supply Analysis and Baseline Simulations.
PB82-107509 1081

LUMBERING
The Activity Fuel Appraisal Process: Instructions and Examples.
PB82-107319 1081

LUNAR EXPLORATION
Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.
N82-11989/2 1103

KEYWORD INDEX

LUTETIUM
The 4f(13)5f Configuration in the Isoelectronic Sequence of Yb III.
PB82-137407 1153

LYMPHOMAS
Feline Malignant Lymphoma: A Multiway Frequency Analysis of a Population Involving Sex, Age, Cell Type, and Tumor Location.
AD-A106 825/3 1122

MACERALS
Statistical Validity for Electron Probe Microanalysis of Organic Sulfur in Coal.
LA-UR-80-585 1228

MACHINES
Monitoring of Machines--Translation.
PB82-140211 1224

MACKEREL
Size and Sex Ratio of King Mackerel, 'Scomberomorus cavalla', in the Southeastern United States.
PB82-109406 1121

MACROPROGRAMMING
'Pseudo', A Macro-Based High Level Language for the PDP-11.
AD-A107 168/7 1172

MAGNESIUM COMPOUNDS
The Storage of Hydrogen in the Form of Metal Hydrides: An Application to Thermal Engines.
N82-11225/1 1269

MAGNESIUM HYDROXIDES
Magnesium Hydroxide Neutron-Shielding Material and Method of Producing Such Material.
DE81030298 1242

MAGNETIC ENERGY STORAGE
1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix A: Energy Storage Coil and Superconductor.
LA-7885-MS(V.2) 1188

1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix B: Cost Study, High-Purity Aluminum Production.
LA-7885-MS(V.3) 1188

1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix D: Superconductive Magnetic Energy Storage Cavern Construction Methods and Costs.
LA-7885-MS(V.5) 1188

1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix F. 1-GWh Electrical System Design.
LA-7885-MS(V.7) 1188

MAGNETIC INDUCTION
Geomagnetic Observations.
N82-11693/0 1085

MAGNETIC LEVITATION
Non-Contacting Suspension and Propulsion Systems for Transportation Applications,
PB82-135591 1221

MAGNETIC MATERIALS
Application of a Rare-Earth Cobalt Magnet to Synchronous Motors.
N82-11358/0 1171

MAGNETIC MEASUREMENT
Magnetic Field Satellite (MAGSAT) Data Processing System Specifications.
N82-11103/0 1174

MAGNETIC MIRROR CONFIGURATIONS
Ambipolar Potential Formation and Control in Bumpy Tori and Mirrors.
DE81030636 1239

MAGNETIC MIRRORS
Mirror Plasma Apparatus.
PATENT-4 260 455 1240

MAGNETIC MONOPOLES
Connection Between the Spin Magnetic Moment of an Electron and the Dirac Monopole.
JINR-R-2-11338 1261

MAGNETIC PROPERTIES
A Review of an Attempt to Create Shatter Cones with Magnetic Flyer Plate Technology.
N82-11492/7 1158

MAGNETIC SEPARATORS
Magnetic Separation of Materials. June, 1976-1981 (Citations from the Energy Data Base).
PB82-859083 1223

MAGNETIC TAPES
Conversion of Spu-Universal Disk File to Jsc-Universal Tape Storage: Convrt User's Guide.
N81-29501/6 1174

MAGNETOACOUSTICS
Magnetomechanical Acoustic Emission--A New Method for Non-Destructive Stress Measurement.
AD-A107 228/9 1228

MAGNETOHYDRODYNAMIC STABILITY
Theory of Drift Instabilities and the Associated Anomalous Transport.
N82-11924/9 1240

An Energy Integral and Variational Principle for Plasma Kinetic Modes.
N82-11926/4 1261

MAGNETOMETERS
Magnetic Field Investigation for ISEE Mother and Daughter Spacecraft.
N82-11105/5 1228

MAGNETOPAUSE
Magnetic Field Investigation for ISEE Mother and Daughter Spacecraft.
N82-11105/5 1228

MAGNETOSPHERE
Voyager Observations of Jupiter's Distant Magnetotail.
AD-A107 126/5 1082

Determination of Jupiter's Electron Density Profile from Plasma Wave Observations.
AD-A107 127/3 1082

The Lower-Hybrid-Drift Instability in Non-Antiparallel Reversed Field Plasmas.
AD-A107 269/3 1084

Geomagnetic Observations.
N82-11693/0 1085

MAGNETS
Application of a Rare-Earth Cobalt Magnet to Synchronous Motors.
N82-11358/0 1171

MAGNONS
Low-Temperature Theories of the Classical One-Dimensional Easy-Plane Ferromagnet: Successes and Limitations,
PB82-131665 1263

Spin-Wave Damping in the Quantum Ising-Heisenberg Chain,
PB82-134149 1263

MAINE
Peat Resource Evaluation: State of Maine. Report for the Quarter Ending August 1981.
DE82000227 1157

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Maine, Volume 19.
HRP-0903711/0 1126

Methodology for Generating Detailed Population Estimates and Projections for the State of Maine: Number 4,
HRP-0903730/0 1113

MAINTENANCE
Safety Effectiveness Evaluation: Federal Highway Administration Non-Interstate Resurfacing, Restoration, and Rehabilitation Program.
PB82-131699 1212

Polymer Concrete Patching. Volume II.
PB82-133679 1220

Polymer Concrete Patching. Volume III. User's Manual.
PB82-133687 1220

User Charge Revenues for Wastewater Treatment Plants--Insufficient to Cover Operation and Maintenance.
PB82-137761 1215

MAINTENANCE MANAGEMENT
Depot Support of Gas Turbine Engines.
AD-A107 141/4 1230

Collection and Use of Pavement Condition Data.
PB82-131970 1212

MAINTENANCE PERSONNEL
The Veterans Administration's Efforts to Consolidate Computer Programming Resources at a Single Location.
AD-A107 197/6 1108

MAIZE
Heterogeneity and Expression of the Zein Storage Protein Gene Family of Maize.
DE81030735 1120

MALIGNANT NEOPLASMS
Selected Aspects of Cancer-Related Proteins, Carbohydrate, Lipid, and Other Biochemistry.
PB81-929905 1120

The United States-Japan Cooperative Cancer Research Program Progress Report, April 1980 through March 1981.
PB82-120635 1131

A New Concept on the Natural Course of Hepatocellular Carcinoma,
PB82-129669 1131

Determination of Estrogen Receptor in Human Colon Cancer Tissue with Labeled Fluorescence Estradiol (Fluorescein Isothiocyanate),
PB82-129719 1131

MALPRACTICE
Recruiting Malpractice: Extent, Causes, and Potentials for Improvement.
AD-A106 844/4 1105

MAMARONECK RESERVOIR DAM
National Dam Safety Program. Mamaroneck Reservoir Dam (Inventory Number N.Y. 111), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 407/9 1206

MAMMALS
Distribution and Abundance of Marine Birds and Mammals Wintering in the Kodiak Area of Alaska.
PB82-140187 1155

MAN
Chemicals Identified in Human Biological Media.
DE81030813 1141

MAN COMPUTER INTERFACE
Addition of Data Feature for FEASIL. Supplement.
AD-A106 992/1 1171

Communications Intelligence: Transcriber Output Enhancement.
AD-A107 296/6 1103

Enhancing Technology Transfer of Computer Hardware and Software Architectures Using Human Factors in Initial Design.
AD-A107 444/2 1104

MAN MACHINE SYSTEMS
Effect of Task Duration on Voice Recognition System Performance.
AD-A107 442/6 1104

MANAGEMENT
Synthetic Fuels Corporation's Management of Demonstration Projects Would Be Limited.
AD-A106 920/2 1266

GAO Comments on the Impact of the USDA Reorganization of Nutrition.
AD-A106 940/0 1089

ORNL Direct Purchase Information System (DPIS) User's Manual.
ORNL/TM-6428 1090

MANAGEMENT GAMES
Management Games. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802489 1094

MANAGEMENT INFORMATION SYSTEMS
Concerns about HHS' Ability to Effectively Implement Incentive Funding for State Information Systems in the Aid to Families with Dependent Children Program.
AD-A106 871/7 1088

The Guaranteed Student Loan Information System Needs a Thorough Redesign to Account for the Expenditure of Billions.
AD-A106 875/8 1088

MANAGEMENT PLANNING AND CONTROL
Efforts to Improve School Lunch Programs--Are They Paying Off.
AD-A106 829/5 1137

Conrail Needs to Further Improve Inventory Control and Management.
AD-A106 837/8 1088

SBA's 7(j) Management Assistance Program: Changes Needed to Improve Efficiency and Effectiveness.
AD-A106 839/4 1088

States' Efforts to Detect Duplicate Public Assistance Payments.
AD-A106 846/9 1113

Department of Labor Needs to Give CETA Prime Sponsors More Guidance and Assistance for Implementing Monitoring Requirements.
AD-A106 847/7 1105

Delays in Receiving and Investing Taxes are Reducing Railroad Retirement Program Interest Income.
AD-A106 861/8 1105

Questionable Use of the C-X and Other Air Force Weapon System Funds.
AD-A106 898/0 1231

Evaluating Program and Mangerial Efficiency: An Application of Data Envelopment Analysis to Program Follow Through.
AD-A107 007/7 1089

Records Filing, Maintenance and Disposition Study for Department of the Army.
AD-A107 079/6 1094

AUTOPILOT: A Distributed Planner for Air Fleet Control.
AD-A107 139/8 1236

The Comptroller of the Currency Should Decide the Extent to Which His Action Control System is Needed.
AD-A107 182/8 1097

Flexitime in an Army Medical Center.
AD-A107 470/7 1109

The Relationship between Adequacy of Test and Evaluation Data and DS ARC Decisions.
AD-A107 496/2 1090

MANAGEMENT TRAINING
SBA's 7(j) Management Assistance Program: Changes Needed to Improve Efficiency and Effectiveness.
AD-A106 839/4 1088

MANNED SPACE FLIGHT
Hungarian Cosmonaut in Space.
N82-11097/4 1272

MANPOWER REQUIREMENTS
Analysis of Nursing Manpower Shortages in Merrimack Valley Home Health Care Agencies, Part I: The Nature and Severity of the Shortage.
HRP-0903740/9 1129

MANUALS
Patient Tracking for High Blood Pressure Control.
PB82-107525 1130

Installation Guidelines for Solar Domestic Hot Water (DHW) Systems in One- and Two-Family Dwellings. Second Edition.

PB82-144676 1202

MANUFACTURING
Manufacturing Methods and Technology Project Execution Report.
AD-A106 868/3 1088

Potential Impediment of Foundry Capacity Relative to National Defense Needs.
AD-A106 885/7 1097

Ultra-Lightweight Mirror Manufacturing and Radiation Response Study.
AD-A106 998/8 1222

The Industrial Processing of Unidirectional Fiber Prepregs.
N82-11119/6 1191

The Effects of Impurities on the Performance of Silicon Solar Cells.
N82-11548/6 1187

MANURES
Interactive Model to Assess Economics of Anaerobic Digestion on the Farm.
DE82000452 1267

MAPPING
Standardization of Map Symbology for Large Scale Maps.
AD-A107 448/3 1156

MAPS
High-Speed Laser Platemaking from Digital Data for the Defense Mapping Agency.
AD-A107 380/8 1156

Determining Optimum Routes from Maps,
PB82-135310 1214

MARGINAL ICE ZONE
MIZEX. A Program for Mesoscale Air-Ice-Ocean Interaction Experiments in Arctic Marginal Ice Zones. I. Research Strategy.
AD-A107 046/5 1169

MARINE ATMOSPHERES
Field Experiments with Artificial Aerosols at San Nicolas Island, California.
AD-A107 270/1 1084

Aerosol Composition in the Marine and Coastal Boundary Layer.
AD-A107 308/9 1084

MARINE BIOLOGY
Evaluation of Existing Marine Intertidal and Shallow Subtidal Biologic Data,
PB82-134065 1155

Proceedings: Annual Gulf of Mexico Information Transfer Meeting (2nd) Held in New Orleans, Louisiana, 1980.
PB82-146333 1155

MARINE CORPS AVIATION
Marine Air Traffic Control and Landing System (MATCALS) Investigation.
AD-A107 384/0 1237

MARINE DISPOSAL
Marine Disposal of Radioactive Wastes. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859307 1245

MARINE ENGINEERING
Drag Reducing Fluids. 1969-October, 1981 (Citations from the NTIS Data Base).
PB82-802372 1254

MARINE ENGINES
Marine Gas Turbine Engines. 1973-1981 (Citations from Information Services in Mechanical Engineering Data Base).
PB82-859893 1224

MARINE ENVIRONMENTS
Flaw Growth of 7075, 7475, 7050 and 7049 Aluminum Alloy Plate in Stress Corrosion Environments: 4-Year Marine Atmosphere Results.
N82-11181/6 1192

MARINE GEOLOGY
A Summary of Environmental Geologic Studies on the Southeastern United States Atlantic Outer Continental Shelf, 1977-1978.
PB82-109273 1158

Marine Sediment Core Descriptions IWSOE 68, 69, 70; Deep Freeze 79,
PB82-132127 1158

The Scientific Program USCGC Glacier Deep Freeze 80,
PB82-132879 1159

St. Peter and St. Paul's Rocks (Equatorial Atlantic) and the Surrounding Sea Floor.
PB82-139403 1159

Proceedings: Annual Gulf of Mexico Information Transfer Meeting (2nd) Held in New Orleans, Louisiana, 1980.
PB82-146333 1155

MARINE GEOPHYSICS
Marine Seismic System At-Sea-Test Deployment Operation. Revision.
AD-A106 991/3 1168

MARINE METEOROLOGY
A Numerical Study of the Role of Air-Sea Fluxes in Extratropical Cyclogenesis.
AD-A107 508/4 1086

MARINE PROPELLERS
Proceedings of the Thirteenth Symposium on Naval Hydrodynamics Held at Tokyo (Japan) on October 6-10 1980,
AD-A106 987/1 1224

MARINE TERMINALS
Marine Terminals. 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859679 1218

MARINE TRANSPORTATION
National Waterways Study Overview of the Transportation Industry.
AD-A107 366/7 1224

Ship Chartering Alternatives for Grain-Exporting Cooperatives.
PB82-130881 1098

Implications of Power Plant Coal Conversions on the Ports of New England: Volume I.
PB82-136409 1231

Implications of Power Plant Coal Conversions on the Ports of New England. Volume II: Appendices,
PB82-136417 1231

MARKET RESEARCH
Irrigation Market for Solar Thermal Parabolic Dish Systems.
N82-11549/4 1182

Marketing and Market Acceptance Data From the Residential Solar Demonstration Program: 1980. Volume 1: Detailed Analysis.
PB82-144635 1184

Marketing and Market Acceptance Data From the Residential Solar Demonstration Program: 1980. Volume 2: Technical Appendix.
PB82-144643 1184

MARKETING
Industry Views on the Ability of the U.S. Photovoltaics Industry to Compete in Foreign Markets.
AD-A106 881/6 1097

The Cooperative Coal Marketing Arrangement in Eastern Kentucky: A Feasibility Report.
PB82-107327 1098

Financial Profile of 15 New Agricultural Marketing Cooperatives,
PB82-131202 1080

Future Developments in the Food Industry: Probable Efforts at Vertical Integration by Food Retailers.
PB82-132374 1098

Cooperative Farm Machinery Operations: Oregon and Wisconsin,
PB82-134123 1080

The Marketing of Alcoholic Beverages. Phase II: An Analytical Framework for Information About Marketing Practices and Consumer Purchasing of Beverage Alcohol Products,
PB82-135278 1099

The Marketing of Alcoholic Beverages. Phase I: Literature Report,
PB82-135286 1099

Marketing Practices in the Alcoholic Beverages Industry: Toward an Understanding of How Macro-Environmental Forces Shape Marketing Strategies in the Alcoholic Beverage Industry. A Supplement to Phases I and II,
PB82-138579 1100

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume III: The Mobile Home Distribution System,
PB82-144346 1100

Economic Analysis of the Single Family Property Disposition Program.
PB82-144395 1100

Assessing the Effects of the Section 8 Program Using the Urban Institute Housing Market Model,
PB82-144445 1101

Market Segmentation. 1974-1981 (Citations from the Management Contents Data Base).
PB82-859042 1102

MARKING
Epoxy Thermoplastic Pavement Marking Material: Specification and Testing.
PB82-135914 1214

MARKOVIAN MODELS
An Analysis of Markovian Model Microfield Methods for Stark Broadening.
PB82-108044 1152

MARRIAGE
Family Roles in Transition. In a Changing Military.
AD-A107 348/5 1113

Military Retention and Retirement. Reciprocal Family/Organization Effects,
AD-A107 349/3 1113

MARSHES
An Assessment of Wetland Habitat Establishment at a Central Florida Phosphate Mine Site.
PB82-130808 1211

MARYLAND
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Maryland, Volume 20.
HRP-0903712/8 1127

MASS SPECTROMETERS
Fundamentals of Ion Motion in Electric Radiofrequency Multipole Fields.
AD-A107 243/8 1253

MASS SPECTROMETRY
Fundamentals of Ion Motion in Electric Radiofrequency Multipole Fields.
AD-A107 243/8 1253

MASS SPECTROSCOPY
Energy and Angle Resolve SIMS Studies of CO on Ni(001).
AD-A107 474/9 1149

Performance Tests for the Evaluation of Computerized Gas Chromatography/Mass Spectrometry Equipment and Laboratories,
PB82-137662 1229

Theoretical Study of the Process of Unimolecular Dissociation of Radicals (Etude Theorique des Processus de Dissociation Unimoleculaire des Radicaux),
PB82-139866 1154

MASS TRANSPORTATION
The Minibuses and the Public Transport System of Kuala Lumpur,
PB82-135799 1214

MASSACHUSETTS
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Massachusetts, Volume 21,
HRP-0903710/2 1126

MATCHED FILTERS
Digital Filters for Infrared Target Acquisition Sensors.
AD-A107 061/4 1236

MATERIALS HANDLING EQUIPMENT
Handling and Transporting Juvenile American Shad,
PB82-136615 1121

MATERIALS RECOVERY
Materials Recycling: An Overview of the Mineral Waste Utilization Symposium (6th).
PB82-133828 1213

Metals Recovery from Wastes. June, 1976-1981 (Citations from the Energy Data Base).
PB82-859604 1194

MATHEMATICAL FILTERS
The Time-Sequenced Adaptive Filter.
AD-A106 908/7 1178

MATHEMATICAL LOGIC
Minimum Weight Design of Flat Sandwich Panels under Edgewise Compression Loads.
AD-A107 096/0 1226

Deductive Synthesis of the Unification Algorithm,
AD-A107 326/7 1173

On the Expressive Power of Dynamic Logic. II,
AD-A107 430/1 1197

MATHEMATICAL MODELS
Stability and Growth Estimates for Electric Fields in Nonconducting Dielectrics with Memory.
AD-A106 982/2 1263

NAVPAC SST Data Processing--Mathematical Description.
AD-A107 082/0 1171

A Model for Ordinal Nonhierarchical Cluster Methods.
AD-A107 111/7 1196

Linearized Solution to Inlet Equation with Inertia.
AD-A107 205/7 1156

A Two-Dimensional Finite Element Advection Model with Variable Resolution.
AD-A107 511/8 1086

Evaluation of Spring Wheat and Barley Crop Calender Models for the 1979 Crop Year.
N81-29508/1 1081

Aeroacoustic Theory for Noncompact Wing-Gust Interaction.
N82-11071/9 1078

An Algorithm for Minimum-Cost Set-Point Ordering in a Cryogenic Wind Tunnel.
N82-11090/9 1228

Antenna Pattern Modification for Single Reflector Antennas.
N82-11338/2 1264

Surface-Tension Induced Instabilities: Effects of Lateral Boundaries.
N82-11390/3 1262

A Three-Dimensional Simulation of Transition and Early Turbulence in a Time-Developing Mixing Layer.
N82-11393/7 1254

Higher-Level Simulations of Turbulent Flows.
N82-11395/2 1254

Integrated Analysis of Engine.
N82-11491/9 1078

A Model Describing the Microwave Emission from a Multi-Layer Snowpack at 37 Ghz.
N82-11510/6 1169

Irrigation Market for Solar Thermal Parabolic Dish Systems.
N82-11549/4 1182

Computation of Averaged Monthly Zonal Albedo Utilizing the Solar Zenith Angle, Properties of Clear and Cloudy Atmospheres.
N82-12010/6 1082

Radiative Transfer in Cometary Dust Atmospheres: Critique of Recent Developments.
N82-12015/5 1083

Alternative Forest Policies for the Pacific Northwest: Study Module V.
PB82-109125 1082

Analyses, Experimental Studies, and Evaluations of Control Measures for Air Flow and Air Quality on and Near Highways. Volume I: Experimental Studies, Analyses, and Model Development.
PB82-133604 1213

Propagation of Density Fluctuations in Nonuniform Fluids: Simple Models,
PB82-140591 1154

Evaluation of Formaldehyde Problems in Residential Mobile Homes.
PB82-144619 1136

MATHEMATICAL PREDICTION

Accuracy of High Frequency Maximum Usable Frequencies (MUF) Prediction.
AD-A107 097/8 1264

Forecast of the Second Destination Transportation Tonnage for the Air Force.
AD-A107 235/4 1230

Estimation of Sensor Detection Probabilities with Data from Concurrent Sensors.
AD-A107 443/4 1178

MATHEMATICAL PROGRAMMING

Proceedings of the ACM Symposium on Symbolic and Algebraic Computation (1981), Snowbird, Utah, 5-7 August 1981.
AD-A107 464/0 1197

MATHEMATICS

Mathematics Curricula Requirements and Performance Levels in Navy Class 'C' Electronics Schools.
AD-A106 995/4 1106

Application of Tactical Data Systems for Training. Volume IV. Development of Courseware and Analysis of Results for GED Math.
AD-A107 530/8 1109

MAXIMUM ENTROPY METHOD

Least Squares Autoregressive (Maximum Entropy) Spectral Estimation for Fourier Spectroscopy and Its Application to the Electron Cyclotron Emission from Plasma.
N82-11925/6 1261

MAXIMUM LIKELIHOOD ESTIMATES

Maximum Likelihood Clustering with Dependent Feature Trees.
N81-29502/4 1198

MAXIMUM LIKELIHOOD ESTIMATION

Maximum Likelihood Estimation of Magnitude-Squared Coherence.
AD-A107 352/7 1197

Identification of Wheelset/Rail Creep Coefficients from Dynamic Response Data Using the Maximum Likelihood Parameter Identification Technique.
AD-A107 447/5 1221

Interactive Maximum Likelihood Estimation,
PB82-134784 1196

MAYFLIES

A New Species of 'Stenonema' (Ephemeroptera: Heptageniidae) from Eastern North America.
PB82-132465 1121

MEALS

Efforts to Improve School Lunch Programs--Are They Paying Off.
AD-A106 829/5 1137

MEAN

Five Robust Indicators of Central Value,
PB82-133109 1198

MEANDERS

Synoptic Observations of the Three-Dimensional Structure and Propagation of Gulf Stream Meanders Along the Carolina Continental Margin.
AD-A107 226/3 1156

MEASUREMENT

The Drift, Diffusion, and Reactions of Slow Ions in Gases - O. N. R. Summary Questionnaire.
AD-A107 129/9 1148

Research on Metal Halide Laser Systems.
AD-A107 398/0 1255

MEASURING INSTRUMENTS

AGARD Flight Test Instrumentation Series. Volume 13. Practical Aspects of Instrumentation System Installation,
AD-A107 355/0 1077

Nitrogen Sensitivities of a Sample of Commercial Hot Cathode Ionization Gage Tubes.
PB82-133877 1152

MECHANICAL CABLES

User's Manual for UCIN-CABLE: Underwater Cables.
AD-A107 236/2 1224

MECHANICAL ENGINEERING

Research in Nonlinear Structural and Solid Mechanics.
N82-11489/3 1262

Space Shuttle Main Engine Controller.
N82-11784/7 1273

MECHANICAL PROPERTIES

Magnetomechanical Acoustic Emission--A New Method for Non-Destructive Stress Measurement.
AD-A107 228/9 1228

MEDICAID

Federal Regulations, Statutes, and Reporting Requirements as Barriers to Efficient Medicaid Program Operations,
PB82-133711 1132

National Monthly Medicaid Statistics, April 1979.
PB82-135815 1132

Medicaid Nursing Home Reimbursement in Minnesota (Volume 3),
PB82-139908 1134

Medicaid Nursing Home Reimbursement in Connecticut (Volume 6),
PB82-139916 1134

Medicaid Nursing Home Reimbursement in Colorado (Volume 7),
PB82-139924 1134

Medicaid Nursing Home Reimbursement in Louisiana (Volume 8),
PB82-139932 1134

A Profile of the Medical Technology Industry and Governmental Policies: A Study of the Effects of Medicare/Medicaid Reimbursement and the 1976 Medical Device Amendments on the Pacemaker Industry. Volume II.
PB82-141839 1100

MEDICAL ASSISTANCE

National Monthly Medicaid Statistics, April 1979.
PB82-135815 1132

MEDICAL COMPUTER APPLICATIONS

An Information System for the Peruvian Air Force Hospital.
AD-A107 440/0 1124

MEDICAL EQUIPMENT

Motorized Wheel Chair.
PAT-APPL-6-288 197 1140

A Profile of the Medical Technology Industry and Governmental Policies. Volume I.
PB82-141821 1100

A Profile of the Medical Technology Industry and Governmental Policies. Appendix A: Review and Assessment of Secondary Data Sources for Developing a Profile of the Medical Technology Industry.
PB82-141847 1141

Cardiac Pacemakers. 1976-1981 (Citations from the Energy Data Base).
PB82-859950 1141

FDA Drug and Device Product Approvals.
PB82-923700 1142

MEDICAL EXAMINATION

The Non-Invasive Evaluation of the Coronary Artery Disease Patient: Clinical, Economic, and Social Issues,
PB82-137951 1134

MEDICAL PERSONNEL

Field Unit Readiness Study (FURS).
AD-A107 469/9 1109

Flexitime in an Army Medical Center.
AD-A107 470/7 1109

MEDICAL RESEARCH

US Army Institute of Surgical Research Annual Research Progress Report, FY 1980.
AD-A107 093/7 1123

Scanning Electron Microscopy/1981/III. An International Journal of Scanning Electron Microscopy, Related Techniques, and Applications. Part III,
AD-A107 525/8 1140

The United States-Japan Cooperative Cancer Research Program Progress Report, April 1980 through March 1981.
PB82-120635 1131

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PB82-136029 1132

MEDICAL SERVICES

Medicare's Reimbursement Policies for Durable Medical Equipment Should be Modified and Made More Consistent.
AD-A106 876/6 1122

MEDICARE

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Executive Summary.
PB82-136144 1133

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume I: Description of the Experiment.
PB82-136151 1133

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume II: Process Evaluation.
PB82-136169 1133

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume III: Provider Questionnaire.
PB82-136177 1133

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume IV: Beneficiary Survey.
PB82-136185 1133

Evaluation of the Colorado Clincial Psychology/Expanded Mental Health Benefits Experiment. Volume V: Impact of the Experiment on the Use, Cost, and Delivery of Medicare Services.
PB82-136193 1134

A Profile of the Medical Technology Industry and Governmental Policies: A Study of the Effects of Medicare/Medicaid Reimbursement and the 1976 Medical Device Amendments on the Pacemaker Industry. Volume II.
PB82-141839 1100

MEDITERRANEAN SEA

The Carbonate System in the Western Mediterranean Sea.
AD-A107 390/7 1168

MEETINGS

Proceedings of the Second Annual Methane Recovery from Coal Beds Symposium.
METC/SP-79/9 1166

Questions and Responses at the 1981 Workshops on Procedures to Demonstrate Attainment of the NAAQS (National Ambient Air Quality Standards) for Ozone in the 1982 SIPs (State Implementation Plans).
PB82-107863 1210

Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume I,
PB82-131426 1211

Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume II,
PB82-131434 1211

Industrial Program Grantee Conference. Proceedings of a Conference Held at Hot Springs, Arkansas, May 12-14, 1980,
PB82-132168 1092

Environmental Speciation and Monitoring Needs for Trace Metal-Containing Substances from Energy-Related Processes: Proceedings of the DOE/NBS Workshop Held at the National Bureau of Standards in Gaithersburg, Maryland on May 18-20, 1981.
PB82-132770 1212

Materials Recycling: An Overview of the Mineral Waste Utilization Symposium (6th).
PB82-133828 1213

COMPUMAG: Papers Presented by Members of the Laboratory at the Conference of the Computation of Electromagnetic Field, Chicago, 14-17 September, 1981,
PB82-134164 1253

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PB82-134263 1110

The Subject Access Problem - Opportunities for Solution: A Workshop Held at Springfield, Virginia on 18-20 October, 1978.
PB82-134529 1096

Sun-Drying Methodology: Report of a Seminar, 21 May 1976.
PB82-136292 1137

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PB82-137266 1193

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PB82-139502 1081

Proceedings of the U.S.-U.S.S.R. Joint Seminar on Building Electrical, Plumbing, and Heating/Ventilating/Air Conditioning Systems.
PB82-144437 1227

State Tax Policy and Urban Economic Development,
PB82-144544 1216

National Association of Counties' Report on Local Government's Priority Needs for Financial Management Capacity Sharing.
PB82-144593 1217

Proceedings: Annual Gulf of Mexico Information Transfer Meeting (2nd) Held in New Orleans, Louisiana, 1980.
PB82-146333 1155

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PB82-146341 1227

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PB82-146358 1167

MELTDOWN

Computational Methods for LMFBR Whole-Core Accident Analysis.
LA-UR-80-1459 1247

MELTS (CRYSTAL GROWTH)

Space Processing of Electronic Materials.
N82-11094/1 1222

Growth of Solid Solution Single Crystals.
N82-11958/7 1253

MEMBRANES

Improvements to Asbestos Diaphragms and Prospects for Their Replacement (Verbesserung von Asbest-Diaphragmen und deren eventueller Ersatz).
PB82-139445 1154

MEMORY (PSYCHOLOGY)
Long and Short-Term Memory Processes in Cortically Damaged Patients.
AD-A107 256/6 1123

Cerebral Economics: Resource Competition within but not Between Hemispheres.
AD-A107 362/6 1112

MENTAL ABILITY
Analysis of the Decision and Verification Stockmarket Tasks Using Additive Stage Process Methods.
AD-A107 502/7 1112

MENTAL DISORDERS
Population-Based Mental Health Needs Assessment Methodology for Use in HSA/SP.
HRP-0903747/4 1129

The Community Mental Health Project: Pilot Project.
PB82-135252 1132

MENTAL HEALTH
The Health Opinion Survey: Predicting Illness in Military Trainees.
AD-A106 853/5 1122

MENTAL HEALTH SERVICES
Mental Health Services: Personal Health Care. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802356 1135

Mental Health Services: Delivery Plans, Programs, and Studies. 1966-November, 1981 (Citations from the NTIS Data Base).
PB82-802703 1112

Mental Health Services: Needs and Demands. 1973-November, 1981 (Citations from the NTIS Data Base).
PB82-802711 1113

MERCURY
Solvent Extraction Studies Using High-Molecular-Weight Amines.
DE81030061 1150

Impact of Energy-Related Pollutants on Chromosome Structure. Progress Report, January 1, 1981-December 31, 1981.
DE82000153 1121

MERCURY CADMIUM TELLURIDES
Space Processing of Electronic Materials.
N82-11094/1 1222

Growth of Solid Solution Single Crystals.
N82-11958/7 1253

MERCURY (METAL)
Modification of a Commercial Atomic Absorption Spectrophotometer for Cold-Vapor Determination of Mercury.
PB82-135716 1229

MERIDIONAL FLOW
Meridional Heat Transport at the Onset of Winter Stratospheric Warming.
N82-11697/1 1085

MESON RESONANCES
Hadronic Cross Sections Study in E exp + E exp - Collisions from 1.350 GeV to 2.125 GeV.
LAL-78-32 1260

MESONS
Hadron Production in Quark Combination with Colors.
JINR-R-2-12154 1258

MESOSPHERE
Measurements of Structural Features in Profiles of Mesospheric Density.
AD-A107 330/3 1084

Ionization and Aerosol Particulates in the Middle Atmosphere.
AD-A107 361/8 1084

METABOLISM
Monitoring Calcium in Trout Eggs Exposed to Hydrazine.
AD-A107 138/0 1144

METAL COATINGS
Energy and Angle Resolve SIMS Studies of CO on Ni(001).
AD-A107 474/9 1149

METAL CONTAINING ORGANIC COMPOUNDS
Environmental Speciation and Monitoring Needs for Trace Metal-Containing Substances from Energy-Related Processes: Proceedings of the DOE/NBS Workshop Held at the National Bureau of Standards in Gaithersburg, Maryland on May 18-20, 1981.
PB82-132770 1212

Differential Pulse Detection in Liquid Chromatography and Its Application to the Measurement of Organometal Cations.
PB82-133976 1153

METAL HYDRIDES
Technical and Economic Aspects of Hydrogen Storage in Metal Hydrides.
N82-11223/6 1268

The Storage of Hydrogen in the Form of Metal Hydrides: An Application to Thermal Engines.
N82-11225/1 1269

METAL INDUSTRY
Utilization of Geothermal Energy in the Mining and Processing of Tungsten Ore. 2ND Quarterly Report.
DOE/ET/27232-T4 1162

METAL OXIDE SEMICONDUCTORS
Effects of a Thin SiO2 Layer on the Formation of Metal-Silicon Contacts.
AD-A107 121/6 1263

Worst-Case Prediction of Single-Particle-Induced Permanent Failures in Microelectronics.
AD-A107 309/7 1171

MOS Circuits. 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859471 1179

MOS Circuits. 1970-1981 (Citations from the NTIS Data Base).
PB82-859489 1179

METAL PLATES
Localized Necking: An Inclined Imperfection Model.
AD-A107 137/2 1191

Flaw Growth of 7075, 7475, 7050 and 7049 Aluminum Alloy Plate in Stress Corrosion Environments: 4-Year Marine Atmosphere Results.
N82-11181/6 1192

Collapse Analysis of Three Dimensional Assemblages of Eccentrically Stiffened Hot Rolled Steel Plates and Shallow Shells.
PB82-132697 1262

METAL SHEETS
Sheet Metal Joining: Nonferrous Alloys. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
PB82-858804 1222

Sheet Metal Joining: Nonferrous Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-858812 1223

Sheet Metal Joining: Ferrous Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-858903 1223

Sheet Metal Joining: Ferrous Alloys. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
PB82-858911 1223

METAL SURFACES
Universal Binding Energy Relations in Metallic Adhesion.
N82-11183/2 1189

METALLOGRAPHY
Computer Analysis Applied to Metallography. 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859539 1194

METALS
Corrosion Fatigue of Metals in Marine Environments.
AD-A107 247/9 1191

Determination of Sample Container Effects on Wearmetals Concentration in MIL-L-7808 Synthetic Lubricant Analyzed on an A/E35U-3 Fluid Analysis Spectrometer.
AD-A107 323/8 1194

Chemicals Identified in Human Biological Media.
DE81030813 1141

Distribution of Actinide Elements in Sediments: Leaching Studies.
ORO-3852-39 1156

Metals Recovery from Wastes. June, 1976-1981 (Citations from the Energy Data Base).
PB82-859604 1194

METEORITES
Meteorites. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-858028 1159

METEOROIDS
Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.
N82-11989/2 1103

METEOROLOGICAL DATA
19304D MLRS, Missile Number BN-051, Round Number V-184/MD-40, 14 August 1981.
AD-A107 084/6 1085

Techniques for the Computation of Wind, Ceiling, and Extinction Coefficient Using Currently Acquired RPV Data.
AD-A107 094/5 1085

19315AT MLRS, Missile Numbers V13-002, V15-003, Round Numbers V-185/AT-9, V-186/AT-10, 18 August 1981.
AD-A107 351/9 1086

19304D MLRS, Missile Number V38-002, Round Number V-183/IW-2, 13 August 1981.
AD-A107 415/2 1086

METEOROLOGICAL INSTRUMENTS
Remote Automatic Weather Station for Resource and Fire Management Agencies.
PB82-107335 1087

METEOROLOGICAL PHENOMENA
Study of Meteorological Conditions Along Actual or Proposed Reentry Trajectories.
AD-A107 035/8 1273

METEOROLOGICAL RADAR
Attenuation Problems Associated with a 5 cm Radar.
AD-A107 215/6 1238

METEOROLOGICAL SATELLITES
Meteorological Factors in High Resolution Satellite Imagery (DMSP).
AD-A107 512/6 1084

Characteristics, of Tiros, Goes, Dmsp and Landsat Systems.
N81-29506/5 1272

METHANE
Acceleration of Methane-Air Ignition by Hydrocarbon Additives.
AD-A107 009/3 1272

Proceedings of the Second Annual Methane Recovery from Coal Beds Symposium.
METC/SP-79/9 1166

METHODOLOGY
Programming Support Library (PSL). Users Manual.
AD-A107 249/5 1172

Programming Support Library (PSL). Technical Report.
AD-A107 250/3 1172

Programming Support Library (PSL). Operations Manual.
AD-A107 251/1 1172

Programming Support Library (PSL). Maintenance Manual. Volume I.
AD-A107 252/9 1172

Programming Support Library (PSL). Maintenance Manual. Volume II.
AD-A107 253/7 1172

METHYL ETHYL KETONE
Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
PB82-107210 1139

METHYL IODIDE
Studies of Free Radicals by Ultraviolet Excimer Laser Photolysis. Progress Report, 1 April 1981-1 October 1981.
DE82000688 1151

METHYL PARATHION
Methyl Parathion Persistence in Soil Following Simulated Spillage.
PB82-127549 1170

METHYL RADICALS
Studies of Free Radicals by Ultraviolet Excimer Laser Photolysis. Progress Report, 1 April 1981-1 October 1981.
DE82000688 1151

METRIC SYSTEM
A Study of Metric Conversion of Distilled Spirits Containers: A Policy and Planning Evaluation: Task I. Comprehensive Report on the Conversion Process,
PB82-134396 1099

METROPOLITAN AREAS
Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Albany, Schenectady, Troy, N.Y. Standard Metropolitan Statistical Area.
PB82-144718 1116

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Los Angeles - Long Beach, Calif. Standard Metropolitan Statistical Area.
PB82-144726 1116

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Madison, Wis. Standard Metropolitan Statistical Area.
PB82-144734 1116

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Newark, N.J. Standard Metropolitan Statistical Area.
PB82-144742 1117

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Orlando, Fla. Standard Metropolitan Statistical Area.
PB82-144759 1117

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Phoenix, Ariz. Standard Metropolitan Statistical Area.
PB82-144767 1117

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Salt Lake City, Utah. Standard Metropolitan Statistical Area.
PB82-144783 1117

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Tacoma, Wash. Standard Metropolitan Statistical Area.
PB82-144791 1117

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Washington, D.C.-Md.-Va. Standard Metropolitan Statistical Area.
PB82-144809 1117

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Wichita, Kans. Standard Metropolitan Statistical Area.
PB82-144817 1117

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Area: Anaheim, Santa Ana, Garden Grove, Calif. Standard Metropolitan Statistical Area.
PB82-144858 1118

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Dallas, Tex., Standard Metropolitan Statistical Area.
PB82-144866 1118

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Fort Worth, Tex., Standard Metropolitan Statistical Area.

PB82-144874 1118

MEXICO
The Environmental Vegetation Index: A Tool Potentially Useful for Arid Land Management.
N81-29505/7 1081

Radar Mapping, Archaeology, and Ancient Land Use in the Maya Lowlands.
N82-11514/8 1104

Crustal Deformation and Seismic Measurements in the Region of Mcdonald Observatory, West Texas.
N82-11695/5 1169

MEXICO GULF
A Summary of Environmental Geologic Studies on the Southeastern United States Atlantic Outer Continental Shelf, 1977-1978.
PB82-109273 1158

Proceedings: Annual Gulf of Mexico Information Transfer Meeting (2nd) Held in New Orleans, Louisiana, 1980.
PB82-146333 1155

MHD POWER PLANTS
Conceptual Design Study of Potential Early Commercial MHD Powerplant. Final Report of Task 2 Results.
DE81030882 1185

MICROCOMPUTERS
Standardization in Microcomputer/LSI Products Via Electronic Information Exchange: JEDEC/EIES Project.
PB82-134735 1176

On-Lining an SDK-85 Microcomputer with a DEC System 10 for Down-Line Loading of Microcomputer Programs.
PB82-134776 1176

Microcomputers: Basic Design and Development. July, 1979-September, 1980 (Citations from the Engineering Index Data Base).
PB82-802406 1177

Microcomputers: Basic Design and Development. October, 1980-November, 1981 (Citations from the Engineering Index Data Base).
PB82-802414 1177

Microcomputers: Design and Software Development. 1979-November, 1981 (Citations from the NTIS Data Base).
PB82-802810 1177

Microcomputers: Telecommunication Applications. July, 1979-June, 1980 (Citations from the Engineering Index Data Base).
PB82-803529 1177

Microcomputers: Telecommunication Applications. July, 1980-October, 1981 (Citations from the Engineering Index Data Base).
PB82-803537 1177

MICROCREEP
Microcreep of Instrument Grade Beryllium.
PB82-137415 1193

MICROELECTRONICS
Worst-Case Prediction of Single-Particle-Induced Permanent Failures in Microelectronics.
AD-A107 309/7 1171

MICROHARDNESS
Microhardness, Friction and Wear of SiC and Si3N4 Materials as a Function of Load, Temperature and Environment.
AD-A107 501/9 1189

MICROORGANISMS
Poultry Meat: Microbiology. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859331 1138

MICROPROCESSORS
Digital Command Augmentation for Lateral-Directional Aircraft Dynamics.
AD-A107 264/4 1079

SYCOL: Informal Language Specification,
PB82-135658 1176

SYCOL: A High Level Language for Applications in Real Time Control Systems,
PB82-135666 1176

Microcomputers: Basic Design and Development. July, 1979-September, 1980 (Citations from the Engineering Index Data Base).
PB82-802406 1177

Microcomputers: Basic Design and Development. October, 1980-November, 1981 (Citations from the Engineering Index Data Base).
PB82-802414 1177

Microcomputers: Design and Software Development. 1979-November, 1981 (Citations from the NTIS Data Base).
PB82-802810 1177

MICROSCOPY
Laser Photoacoustic Technique for NDE.
AD-A107 388/1 1228

MICROSTRUCTURE
Development of Microfabrication Techniques.
AD-A107 128/1 1222

MICROWAVE AMPLIFIERS
A 31-GHz Monolithic GaAs Mixer/Preamplifier Circuit for Receiver Applications.
AD-A107 082/2 1178

MICROWAVE EMISSION
A Model Describing the Microwave Emission from a Multi-Layer Snowpack at 37 Ghz.
N82-11510/6 1169

MICROWAVE EQUIPMENT
Automatic Microwave Network Analyzer Calibration by Reference to a Transmission-Line Standard with Applications to Characterization of Adapters, Devices, and Coaxial Lines with SMA Connectors.
AD-A107 198/4 1227

Establishment of Production Techniques for Transducer Acoustic Delay Lines on a Pilot Line Basis.
AD-A107 339/4 1178

MICROWAVE LANDING SYSTEMS
Microwave Landing System Flare Subsystem Test.
AD-A107 327/9 1237

MICROWAVE OSCILLATORS
Surface Acoustic Wave Microwave Oscillator and Frequency Synthesizer.
AD-A107 539/9 1178

MICROWAVE RADIOMETERS
Antenna Pattern Modification for Single Reflector Antennas.
N82-11338/2 1264

MICROWAVE RECEIVERS
Satellite Receivers. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-858390 1235

MICROWAVE SENSORS
Technology Transfer of NASA Microwave Remote Sensing System.
N82-11515/5 1228

MICROWAVE TRANSMISSION
Parametric Study of Microwave-Powered High-Altitude Airplane Platforms Designed for Linear Flight.
N82-11050/3 1077

Investigation of Direct Solar-to-Microwave Energy Conversion Techniques.
N82-11544/5 1186

MICROWAVES
Computer-Based Operant Behavioral System for Microwave Bioeffects Research.
AD-A107 021/8 1143

Microwave Irradiation and Instrumental Behavior in Rats: Unitized Irradiation and Behavioral Evaluation Facility.
AD-A107 023/4 1143

Analysis of Periodic Ferrite Slab Waveguides by Means of Improved Perturbation Method.
AD-A107 024/2 1170

Proceedings of a Workshop on the Protection of Personnel against Radiofrequency Electromagnetic Radiation Held at the Royal Air Force Establishment, Farnborough, United Kingdom, 6-8 April 1981.
AD-A107 357/6 1143

MILITARY DEPENDENTS
As Parents Go, So Go the Children. The Development and Adjustment of Children in the Military.
AD-A107 347/7 1112

MILITARY ENGINEERING
Survivability--The Effort and the Payoff.
AD-A107 108/3 1230

MILITARY FAMILIES
As Parents Go, So Go the Children. The Development and Adjustment of Children in the Military.
AD-A107 347/7 1112

Family Roles in Transition. In a Changing Military.
AD-A107 348/5 1113

Military Retention and Retirement. Reciprocal Family/Organization Effects,
AD-A107 349/3 1113

MILITARY FORCES (FOREIGN)
The Role of the Armed Forces in the Mexican Economy in the 1980's.
AD-A107 509/2 1097

MILITARY FORCES (UNITED STATES)
U.S. Role in Sinai Important to Mideast Peace.
AD-A106 899/8 1102

MILITARY OPERATIONS
Development of Data Processing Strategies for Potential Application in the Tactical Operations Systems (TOS) and Other Tactical Data Systems.
AD-A107 532/4 1232

MILITARY PERSONNEL
Utilization of Tactical Computers for Training: Field Evaluation Plan.
AD-A107 316/2 1108

Family Roles in Transition. In a Changing Military.
AD-A107 348/5 1113

Military Retention and Retirement. Reciprocal Family/Organization Effects,
AD-A107 349/3 1113

Employment and Unemployment Among Vietnam Era Veterans: An Analysis of the 1979 National Survey of Veterans,
PB82-136912 1110

Organizational Socialization: Predictors of Commitment during and After Entry.
PB82-137746 1110

MILITARY PROCUREMENT
Joining the Defense Directives and Defense Acquisition Regulatory Systems,
AD-A107 142/2 1230

Information on the U.S. Coast Guard's Decision to Purchase the M/V Cowslip Vessel.
AD-A107 374/1 1231

MILITARY SATELLITES
Space-Based Radar Array System Simulation and Validation.
AD-A106 996/2 1238

Technology Assessment for Future EHF MILSATCOM Systems.
AD-A107 059/8 1233

MILITARY STRATEGY
The Soviet View of Local Wars and Wars of National Liberation: Strategy and Concepts of Employment.
AD-A107 075/4 1231

MILITARY TRAINING
Utilization of Tactical Computers for Training: Field Evaluation Plan.
AD-A107 316/2 1108

Proceedings of the 2nd Interservice/Industry Training Equipment Conference Held in Salt Lake City, Utah, November 18 through November 20, 1980.
AD-A107 437/6 1109

MILITARY VEHICLES
Cross Correlation in a Space-Diversity System on a Military Vehicle.
AD-A107 114/1 1178

MILK
Determination of Skimmed-Milk Powder in Feedingstuffs: Study of Some Interferences,
PB82-137852 1137

MILL TAILINGS
Summary of the Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000816 1244

Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000817 1244

MINE CLOSURES
Technical and Economic Evaluation of Mine Closure Procedures.
PB82-136995 1167

MINE COUNTERMEASURES
Mine/Countermine Problems During Winter Warfare.
AD-A107 047/3 1231

MINE FIRES
Underground Metal and Nonmetal Mine Fire Protection, Proceedings: Bureau of Mines Technology Transfer Seminars, Denver, Colorado, November 3, 1981, and St. Louis, MO., November 6, 1981.
PB82-146358 1167

MINE HOISTING
Development of a Man and Supply Hoisting System for Underground Metal and Nonmetal Mines. Volume II. Operation and Maintenance Manual.
PB82-132515 1166

The Investigation of a Fracture on One Side of a Skip Bridle in a Mine Shaft,
PB82-133372 1166

MINE RESCUES
Evaluation of the Seismic System for Locating Trapped Miners.
PB82-138660 1167

MINE SAFETY
Evaluation of the Seismic System for Locating Trapped Miners.
PB82-138660 1167

Underground Metal and Nonmetal Mine Fire Protection, Proceedings: Bureau of Mines Technology Transfer Seminars, Denver, Colorado, November 3, 1981, and St. Louis, MO., November 6, 1981.
PB82-146358 1167

MINE SHAFTS
The Investigation of a Fracture on One Side of a Skip Bridle in a Mine Shaft,
PB82-133372 1166

MINERAL DEPOSITS
Remote Sensing Applied to Geology and Mineralogy. 1973-November, 1981 (Citations from the NTIS Data Base).
PB82-802570 1159

MINERAL WOOL
Industrial Hygiene Survey Report at U.S. Gypsum Corporation, Birmingham, Alabama.
PB82-107194 1139

MINERALOGY
Meteorites. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-858028 1159

MINERALS
Minerals Critical to Developing Future Energy Technologies, Their Availability, and Projected Demand.
AD-A106 903/8 1180

US Energy Sources and Materials Needs.
LASL-80-10(BRIEF) 1182

MINES (EXCAVATIONS)
Development of a Man and Supply Hoisting System for Underground Metal and Nonmetal Mines. Volume II. Operation and Maintenance Manual.
PB82-132515 1166

Factor of Safety Charts for Estimating the Stability of Saturated and Unsaturated Tailings Pond Embankments.
PB82-135518 1167

The Water Spray Cooler - An Update.
PB82-135724 1167

Technical and Economic Evaluation of Mine Closure Procedures.
PB82-136995 1167

MINIATURE ELECTRONIC EQUIPMENT
A True Air Speed Sensor for Miniature Unmanned Aircraft.
AD-A106 967/3 1079

MINIBUSES
The Minibuses and the Public Transport System of Kuala Lumpur,
PB82-135799 1214

MINIMAX TECHNIQUE
Annual Progress Report.
AD-A106 983/0 1196

MINING
Geologic Considerations in Underground Coal Mining System Design.
N82-11516/3 1166

Water Jet Perforation: A New Method of Completing and Simulating In situ Leaching Wells.
PB82-135583 1167

MINING ENGINEERING
Comments on Interior's Surface Mining Regulations.
AD-A107 185/1 1161

MINNESOTA
Energy Use in Minnesota Public Buildings: Data Management and Analysis.
ORNL/CON-53 1182

Medicaid Nursing Home Reimbursement in Minnesota (Volume 3),
PB82-139908 1134

MINORITIES
Still No Progress in Implementing Controls over Contracts and Grants with Indians.
AD-A106 830/3 1087

MIRRORS
Ultra-Lightweight Mirror Manufacturing and Radiation Response Study.
AD-A106 998/8 1222

Structural Design of a Large Deformable Primary Mirror for a Space Telescope.
AD-A107 260/2 1256

Fracture Mechanics of Cellular Glass.
N82-11209/5 1189

Secondary and Compound Concentrators for Parabolic Dish Solar Thermal Power Systems.
N82-11550/2 1182

MIS (SEMICONDUCTORS)
Low Temperature Growth and Electrical Characterization of Insulators for GaAs MISFETS.
N82-11959/5 1171

MISSION PLANNING
A Proposed New Policy for Planetary Protection.
N82-11095/8 1272

MISSISSIPPI
Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Jackson Quadrangle of Mississippi and Louisiana. Final Report.
GJBX-153(80) 1163

Aerial gamma Ray Amd Magnetic Survey: Mississippi and Florida Survey, Meridian Quadrangle of Mississippi and Alabama. Final Report.
GJBX-154(80) 1163

Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Hattiesburg Quadrangle of Mississippi, Alabama, and Louisiana. Final Report.
GJBX-155(80) 1163

MISSISSIPPI RIVER
Biological Activity and Chemical Characteristics of Dredge Material from 10 Sites on the Upper Mississippi River,
AD-A107 276/8 1135

Uranium and Thorium Series Nuclides in River Sediments and River Water.
ORO-3852-37 1246

MISSOURI
Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Springfield Quadrangle of Missouri. Final Report.
GJBX-149(80) 1162

Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Harrison Quadrangle, Missouri and Arkansas. Final Report.
GJBX-150(80) 1162

Evaluation of Multiband, Multitemporal, and Transformed Landsat Mss Data for Land Cover Area Estimation.
N81-29496/9 1080

Evaluation of Large Area Crop Estimation Techniques Using Landsat and Ground-Derived Data.
N81-29511/5 1081

MISSOURI NO NAME 27 DAM
National Dam Safety Program. MO Noname 27 Dam (MO 10353), Missouri - Nemaha - Nodaway Basin, Holt County, Missouri. Phase I Inspection Report.
AD-A107 540/7 1208

MISSOURI NO NAME 548 DAM
National Dam Safety Program. No Name 548 Pfizer Inc. Dam (MO 30705), Mississippi - Kaskaskia - St. Louis Basin, Washington County, Missouri. Phase I Inspection Report.
AD-A107 543/1 1208

MIXERS (ELECTRONICS)
A 31-GHz Monolithic GaAs Mixer/Preamplifier Circuit for Receiver Applications.
AD-A107 062/2 1178

MIXTURES
Burning Rate Maximum of a Plane Premixed Flame.
AD-A107 163/8 1264

Evaluation of Tests for Determining the Pumpability of Concrete Mixtures.
AD-A107 524/1 1218

MOBILE HOMES
Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume II. The Mobile Home Production System,
PB82-144338 1100

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume III: The Mobile Home Distribution System,
PB82-144346 1100

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume IV: The Mobile Home Park System,
PB82-144353 1100

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume V: Public Regulation,
PB82-144361 1100

MODAL RESPONSE
Advanced Superposition Methods for High Speed Turbopump Vibration Analysis.
N82-11465/3 1225

Modal Analysis Using a Fourier Analyzer, Curve-Fitting, and Modal Tuning.
N82-11490/1 1262

MODEL MICROFIELD METHOD
An Analysis of Markovian Model Microfield Methods for Stark Broadening.
PB82-108044 1152

MODEL THEORY
Annual Progress Report.
AD-A106 983/0 1196

A Model for Ordinal Nonhierarchical Cluster Methods.
AD-A107 111/7 1196

MODELS
Developer Supply, Investor Demand, and Multifamily Housing Production: A Pilot Study,
PB82-144916 1119

MODULATION TRANSFER FUNCTION
Modulation/Demodulation Techniques for Satellite Communications. Part 4: Appendices.
N82-11341/6 1234

MODULATORS
Solar Energy Modulator.
PAT-APPL-6-284 286 1183

MOIRE FRINGES
Dynamic Moire Methods for Detection of Loosened Space Shuttle Tiles.
N82-11434/9 1273

MOISTURE
Neutron-Capture gamma-Ray Analysis of Coal for Sulfur, Iron, Silicon and Moisture.
IS-T-847 1165

MOISTURE CONTENT
A Basic Computer Program to Calculate Moisture Content in Resins and Fibre Reinforced Resin Composites.
AD-A106 970/7 1194

MOISTURE MIGRATION
Thermal Conductivity of a Concrete Mortar from 95 K to 320 K,
PB82-134370 1220

MOLDS
New Molding Method of Three-Dimensional Hollow Photoelastic Model and Centrifugal Stress Analysis of Air Cooled Turbine Blade Model.
N82-11067/7 1270

MOLECULAR BEAM EPITAXY
Development of MBE Grown Pb-Salt Semiconductor Lasers for the 8.0 to 15.0 Micrometer Spectral Region.
N82-11453/9 1255

MOLECULAR BEAMS
Molecular Beam Epitaxy of Ge-GaAs Superlattices.
AD-A107 157/0 1252

MOLECULAR DYNAMICS
Behavior of a Nonconformal Mixture via Computer Simulation.
PB82-137423 1153

MOLECULAR ENERGY LEVELS
The 4f(13)5f Configuration in the Isoelectronic Sequence of Yb III.
PB82-137407 1153

MOLECULAR IONS
Laser-Induced-Fluorescence Studies of Fragment Ions: CH Exp + and CD exp + .
DE82001010 1151

MOLECULAR ORBITALS
Charge Transfer in Collisions of Li-3(+) And Be-4(+) Ions with Atomic Hydrogen at Low Impact Energy.
N82-11927/2 1152

MOLECULAR PROPERTIES
Laser-Stimulated Molecular Dynamics and Rate Processes.
AD-A107 246/1 1149

MOLECULAR SIEVES
Molecular Sieves. 1976-1981 (Citations from the Energy Data Base).
PB82-858499 1147

Molecular Sieves. 1970-1981 (Citations from the NTIS Data Base).
PB82-858507 1147

MOLECULAR STRUCTURE
Formaldehyde: Electronic Structure Calculations for the S(0) and T(1) States.
AD-A107 016/8 1148

NRCC Software Catalog. Volume 1.
LBL-10811 1174

Theoretical Study of the Process of Unimolecular Dissociation of Radicals (Etude Theorique des Processus de Dissociation Unimoleculaire des Radicaux),
PB82-139866 1154

MOLECULE MOLECULE INTERACTIONS
Time-Resolved Infrared Study of Bimolecular Reactions between Tert-Butly Radicals.
AD-A107 154/7 1148

MOLECULES
Post Hartree-Fock: Configuration Interaction.
LBL-823ɔ 1151

MOLTEN CARBONATE FUEL CELLS
High-Temperature Fuel Cell Research and Development. Final Technical Status Report, June 1977-September 1978.
DE81023095 1185

MOLTEN SALT COAL GASIFICATION PROCESS
Fossil Energy Program. Quarterly Progress Report for the Period Ending June 30, 1981.
DE82000505 1268

MONITORING
Diagnostic and Condition Monitoring System Assessment for Army Helicopter Modular Turboshaft Engines.
AD-A107 315/4 1270

MONITORS
Automated Water Monitor System Field Demonstration Test Report. Volume 1: Executive Summary.
N82-11991/8 1209

Automated Water Monitor System Field Demonstration Test Report. Volume 2: Technical Summary.
N82-11992/6 1209

High Concentration Dust Monitor.
PB82-139320 1229

MONOSTATIC RADAR
A high-Frequency Broadband Transmitter for Monostatic Systems.
AD-A107 088/7 1238

MONROE (MICHIGAN)
Final Environmental Impact Statement on Modifications to Monroe Harbor, Michigan.
AD-A106 979/8 1204

MOON
Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.
N82-11989/2 1103

MORTARS (MATERIALS)
Thermal Conductivity of a Concrete Mortar from 95 K to 320 K,
PB82-134370 1220

MORTGAGES
Risk of Inner-City Mortgage Lending,
PB82-144627 1101

MOTION PICTURES
Review of Government-Wide Contracting Systems for Film and Videotape Productions.
AD-A107 175/2 1089

MOTOR GENERATORS
Active Superconductive Generator Development 400-Horsepower Generator Design.
AD-A107 513/4 1185

MOTOR VEHICLES
Properties of Antilock Systems: Descriptive Parameters Used in Analyzing the Braking and Handling of Heavy Trucks. Volume 5.
PB82-133273 1221

KEYWORD INDEX

MOUND LABORATORY
Annual Environmental Monitoring Report: Calendar Year 1979.
MLM-2700 1246

MUD
Influence of Drilling Muds on the Primary Chemosensory Neurons in Walking Legs of the Lobster, 'Homarus americanus'.
PB82-128190 1136

MULLITE
Materials Analyses of Ceramics for Glass Furnace Recuperators.
ORNL/TM-6970 1190

MULTICHANNEL COMMUNICATIONS
Multichannel Adaptive Filtering for Signal Enhancement.
AD-A106 910/3 1233

MULTIPROCESSING
Design Concepts for a Hierarchical Two Dimensional Multiprocessor Structure.
PB82-135633 1176

Simulation of a Two-Dimensional Multiprocessor Structure.
PB82-136953 1177

MULTIPROCESSORS
The Impact of Multiprocessor Technology on High-Level Language Design.
AD-A107 533/2 1173

MULTISTAGE COMPRESSORS
Multistage Axial Compressor Program on Tip Clearance Effects.
AD-A107 445/9 1270

MULTIVARIATE STATISTICAL ANALYSIS
Methods for Presentation and Display of Multivariate Data.
N82-11833/2 1198

MUNICIPALITIES
Forecasting Municipal Revenues and Expenditures: A Primer and Handbook.
PB82-144528 1093

Three Major Issues Influencing Local Financial Management Capacity: The Perspective of Mayors.
PB82-144577 1217

MUNITIONS INDUSTRY
Pollution Caused by Ammunition Manufacturing. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802737 1147

MUONS
Study of Neutrino-Produced Dimuons Using the Fermilab 15-Foot Bubble Chamber and External Muon Identifier.
DE81025788 1257

MUSCLES
Isometric, Isotonic, and Isokinetic Torque Variations in Four Muscle Groups through a Range of Joint Motion.
AD-A107 324/6 1142

MUSCULAR FUNCTION
Electron Microscopical and Histochemical Studies on the Transverse Striated Muscles of Birds after Prolonged Hypokinesis.
N82-11759/9 1144

MUTAGEN SCREENING
Review of Short-Term Screening Tests for Mutagens, Toxigens, and Carcinogens.
ANL/BIM-79-1 1144

MUZZLE FLASH
Use of Foam to Reduce Gun Blast Noise Levels.
AD-A107 081/2 1251

Secondary Combustion in Gun Exhaust Flows.
AD-A107 312/1 1251

MUZZLE FLOW
Muzzle Flow in the Presence of an Anti-Recoil Plate: Exploratory Study.
AD-A107 314/7 1251

MW LINE OF SIGHT COMMUNICATION
Selective Fading on a Long 8 GHz Line-of-Sight Path in Europe.
PB82-130519 1235

N TYPE SEMICONDUCTORS
Inter-Soliton Electron Hopping Transport in Trans-(CH)x.
AD-A106 966/5 1263

GaAs Shallow-Homojunction Solar Cells on Ge-Coated Si Substrates.
AD-A107 056/4 1184

NACELLES
Low Speed Testing of the Inlets Designed for a Tamden-Fan V/STOL Nacelle.
N82-11042/0 1077

NAPHTHALENE
Naphthalene: Pesticide Registration Standard.
PB82-139437 1136

NAPHTHALENES
Symmetry Extinction of LEED Beams for Naphthalene Adsorbed on Pt(lll).
AD-A106 963/2 1148

Chemisorption and Thermal Chemistry of Azulene and Naphthalene Adsorbed on Pt(lll).
AD-A107 068/9 1148

NAPHTHOLS
Excited-State Proton Transfer Kinetics in 1-Naphthol Compounds and Organometallic Complexes.
LA-UR-80-1928 1151

NASA PROGRAMS
Lewis Research Center's Coal-Fired, Pressurized, Fluidized-Bed Reactor Test Facility.
N82-11397/8 1265

Nasa Patent Abstracts Bibliography: A Continuing Bibliography, Section 1, Abstracts. Supplement 19.
N82-11981/9 1095

Nasa Patent Abstracts Bibliography: A Continuing Bibliography, Section 2, Indexes. Supplement 19.
N82-11982/7 1095

NASTRAN COMPUTER PROGRAM
The Dynamic Design-Analysis Method (DDAM) in NASTRAN.
AD-A107 074/7 1262

Automatic Input Data Generation for ADINA and NASTRAN Structural Computer Codes.
AD-A107 534/0 1262

NATIONAL CANCER INSTITUTE
An Analysis of Research Publications Supported by NIH (National Institutes of Health) 1970-1976: NIH and NCI (National Cancer Institute).
PB82-108614 1130

NATIONAL DEFENSE
Potential Impediment of Foundry Capacity Relative to National Defense Needs.
AD-A106 885/7 1097

NATIONAL ENVIRONMENTAL SPECIMEN BANK
Pilot Program for the National Environmental Specimen Bank. Phase I.
PB82-133943 1132

NATIONAL EYE INSTITUTE
Anatomy and Assessment of Program Planning at the National Eye Institute.
PB82-107689 1091

NATIONAL GOVERNMENT
Digest of Labor Arbitration Awards in the Federal Service (Supplement No. 10).
PB82-126257 1109

ORD Extramural Program Guide FY 1981.
PB82-135989 1093

A Systematic Management Approach Is Needed for Congressional Reporting Requirements.
PB82-137753 1096

The Effects of Future Information Processing Technology on the Federal Government ADP Situation.
PB82-138181 1177

Stronger Federal Effort Needed in Fight Against Organized Crime.
PB82-139148 1115

NATIONAL HEART LUNG AND BLOOD INSTITUTE
An Evaluation of the National Heart, Lung and Blood Institute's Pulmonary Academic Award Program.
PB82-141326 1135

NATIONAL INSTITUTES OF HEALTH
An Analysis of Research Publications Supported by NIH (National Institutes of Health) 1970-1976: NIH and NCI (National Cancer Institute).
PB82-108614 1130

NATURAL GAS
FERC Should Improve the Natural Gas Well Determination Process.
AD-A106 859/2 1265

Utility Rate Guide for SOLCOST Data Bank Cities.
DE82000468 1268

State Flows of Energy in 1975.
ORNL/TM-6977 1183

Kinetics of Gas Hydrate Formation. Part I: Kinetics of Ethane Gas Hydrate Formation. Part II: Kinetics of Natural Gas Hydrate Formation.
PB82-138868 1153

NATURAL GAS DEPOSITS
Evaluation of Resource-Assessment Values and in-Situ Combustion Potential for the OH-4 and PA-3 Wells. Final Report.
DE82000388 1157

Western Gas Sands Project. Interim Economic Analysis of Natural Gas Production from Tight Formations in Selected Western Basins.
DE82000709 1162

Bidding and Production Profiles for the Various Outer Continental Shelf Leasing Methodologies, 1954 to 1978.
LA-8497-MS 1182

NATURAL GAS WELLS
Integration, Interpretation and Evaluation of Results in a Multi-Well Interference Test Project. Quarterly Financial Summary and Monthly Technical Report.
DE81030377 1161

Western Gas Sands Project. Interim Economic Analysis of Natural Gas Production from Tight Formations in Selected Western Basins.
DE82000709 1162

NATURE RESERVES
Geohydrology of Bandelier National Monument, New Mexico.
LA-8461-MS 1160

NAVAL LOGISTICS
Applications of Renewal Theory in Analysis of the Free-Replacement Warranty.
AD-A107 086/1 1089

NAVAL OPERATIONS
Supply Workload Implications of Increased Deployment to the Indian Ocean.
AD-A106 994/7 1230

NAVAL PLANNING
Multiple-Agent Planning Systems.
AD-A107 219/8 1122

NAVAL TRAINING
Preparation and Design for a Training Effectiveness Evaluation of Device 2F64C for Replacement Pilot Training.
AD-A106 939/2 1106

Mathematics Curricula Requirements and Performance Levels in Navy Class 'C' Electronics Schools.
AD-A106 995/4 1106

Prototype Equipment Student Guide for ACE (Air Intercept Controller Prototype Training System).
AD-A106 999/6 1106

Behavioral Objectives for Air Intercept Controller Prototype Training System.
AD-A107 001/0 1106

Training Improvements for the Tactical Aircrew Training System (TACTS): Project Summary Report.
AD-A107 003/6 1107

Initial Skill Training for Navy Enlisted Personnel.
AD-A107 177/8 1107

Development of a Computer Based Air Combat Maneuvering Range Debrief System. Volume I.
AD-A107 342/8 1108

NAVAL VESSELS
Logistics Concerns over Navy's Guided Missile Frigate FFG-Class.
AD-A107 500/1 1224

NAVIER-STOKES EQUATION
Some Observations on a New Numerical Method for Solving Navier-Stokes Equations.
N82-11032/1 1254

Computation of High Reynolds Number Internal/External Flows.
N82-11046/1 1254

A Computer Solution to the Stationary Navier-Stokes Equations in Two Dimensions with Proven Convergence.
N82-11398/6 1254

NAVIER-STOKES EQUATIONS
Boundary-Fitted Coordinate Transformation for Thermo-hydraulic Analysis in Arbitrary Three-Dimensional Geometries.
NUREG/CR-2313 1197

NAVIGATION SATELLITES
NAVPAC SST Data Processing--Mathematical Description.
AD-A107 082/0 1171

NAVIGATIONAL AIDS
Simulator Evaluation of Electronic Radio Aids to Navigation Displays, the RA-1 Experiment.
AD-A106 941/8 1236

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AD-A107 045/7 1236

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AD-A107 072/1 1236

NAVSAT
NAVPAC SST Data Processing--Mathematical Description.
AD-A107 082/0 1171

NEBRASKA
Regional Tectonics and Seismicity of Eastern Nebraska.
NUREG/CR-2411 1168

NEGOTIATIONS
Let's Make a Deal or On the Way to Public - Private Partnerships.
PB82-144536 1093

NEODYMIUM LASERS
Fluorescent Glasses for Use in Fluorescently Pumping Nd 3(+) Doped Laser Glass.
AD-A107 503/5 1255

NEON
Energy and Tangential Momentum Accommodation on Different Flashed Tungsten and Gas Covered Tungsten Surfaces.
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MLM-2727 1240

NEOPLASMS
Feline Malignant Lymphoma: A Multiway Frequency Analysis of a Population Involving Sex, Age, Cell Type, and Tumor Location.
AD-A106 825/3 1122

NERVE TRANSMISSION
Neurotransmitter Mechanisms in the Nucleus Accumbens Septi and Related Regions in the Rat Brain.
AD-A107 453/3 1142

NERVES
Verdict on Vagotomy.
AD-A106 959/0 1122

NETWORK CONTROL
Concept for a Power System Controller for Large Space Electrical Power Systems.
N82-11109/7 1177

NETWORK FLOWS
A 'Uniformity Principle' for Evacuation Route Allocation,
PB82-140633 1199

NETWORK SYNTHESIS
Tuned Analog Network.
PAT-APPL-6-301 077 1179

NEUROLOGIC DISEASES
Brain Destruction Alone Does Not Elevate Brain Aluminum.
PB82-133968 1132

NEURONS
Influence of Drilling Muds on the Primary Chemosensory Neurons in Walking Legs of the Lobster, 'Homarus americanus'.
PB82-128190 1136

NEUTRAL BEAM SOURCES
Monte Carlo Simulation of Molecular Flow in a Neutral-Beam Injector and Comparison with Experiment.
DE82000503 1239

NEUTRAL BEAMS
Boosting Up of Neutral Beam Heating Power by Slowly Rising Toroidal Field.
N82-11929/8 1240

NEUTRALIZERS
Method of Neutralizing the Corrosive Surface of Amine-Cured Epoxy Resins.
PAT-APPL-6-293 412 1195

NEUTRINO REACTIONS
Study of Neutrino-Produced Dimuons Using the Fermilab 15-Foot Bubble Chamber and External Muon Identifier.
DE81025788 1257

Transverse Properties of Hadrons Produced in Neutrino-Nucleon Scattering in BEBC,
PB82-135732 1260

NEUTRON BEAMS
Polarized Targets and Polarized Low Energy Neutrons at WNR.
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NEUTRON REACTIONS
Comparison of the ENDF/B-V and SOKRATOR Evaluations of exp 235 U, exp 239 Pu, exp 240 Pu and exp 241 Pu at Low Neutron Energies.
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NEUTRON STARS
Thermonuclear Model for gamma -Ray Bursts.
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NEW HAMPSHIRE
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Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: New Jersey, Volume 30.
HRP-0903770/6 1129

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Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: New Mexico, Volume 31.
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Fossil Energy Materials Needs Assessment.
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NICKEL COMPOUNDS
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NIMBUS 7 SATELLITE
Development of the Coastal Zone Color Scanner for Nimbus 7. Volume 1: Mission Objectives and Instrument Description.
N82-11511/4 1228

NIMONIC PE16
Thermophysical Properties of Selected Wear-Resistant Alloys.
HEDL-TME-79-6 1192

NIOBATES
Study of the Two-Photon Photorefractive Effect in Lithium Niobate,
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NIOBIUM BASE ALLOYS
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The Adsorption of NO on Ni (111): An ESDIAD/LEED Study.
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NITROSO COMPOUNDS
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NOISE (ELECTRICAL AND ELECTROMAGNETIC)
Techniques for Speckle Noise Removal.
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NOISE LEVELS
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NOISE MEASUREMENT
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Use of Foam to Reduce Gun Blast Noise Levels.
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Design and Fabrication of Coanda Suppressor Flow Visualization Model,
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PB82-107186 1139

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PB82-107269 1140

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PB82-133513 1112

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NOISE SPECTRA
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Magnetomechanical Acoustic Emission--A New Method for Non-Destructive Stress Measurement.
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Brittle Materials Design, High Temperature Gas Turbine.
AD-A107 522/5 1189

NONDESTRUCTIVE TESTS
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N82-11862/1 1228

NONHIERARCHICAL CLUSTERING
A Model for Ordinal Nonhierarchical Cluster Methods.
AD-A107 111/7 1196

NONLINEAR SYSTEMS
The Use of Output Moments to Predict Performance of Nonlinear Systems with Gaussian Inputs.
AD-A106 905/3 1178

Nonparametric Identification of a Class of Nonlinear Close-Coupled Dynamic Systems.
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NONNEWTONIAN FLUIDS
Drag Reducing Fluids. 1969-October, 1981 (Citations from the NTIS Data Base).
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Applications of Non-Parametric Statistics and Analysis of Variance on Sample Variances.
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NONUNIFORM FLOW
A Wake Source Model for Non-Symmetric Flow past Bluff Bodies in Two-Dimensional Flow.
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NONUNIFORM PLASMAS
Oblique Propagation of Electron Thermal Modes Below the Electron Plasma Frequency Without Boundary Effects.
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NONVOLATILE MEMORIES
MNOS/CCD Nonvolatile Analog Memory.
AD-A107 229/7 1172

NOREPINEPHRINE
Dopamine Depletion Slows Retinal Transmission.
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NORTH AMERICA
Effects of Acid Precipitation in North America.
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Photoemulsion Method Application for Investigation of Plasma Neutron Radiation.
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NUCLEAR ENERGY LEVELS
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Scale Modeling for the PATRIOT Electromagnetic Pulse Test.
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PLUMBBOB Series, 1957.
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NUCLEAR INDUSTRIAL APPLICATIONS
Coal and Nuclear Wastes--Both Potential Contributors to Environmental and Health Problems.
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The Chemistry of Polyacetylene Doping.
AD-A107 165/3 1195

(13)C NMR of AsF5 Doped Polyacetylene.
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NUCLEAR MATERIALS DIVERSION
In-Process Inventory Estimation for Pulsed Columns and Mixer-Settlers.
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NUCLEAR MATERIALS MANAGEMENT
Materials Management in an Internationally Safeguarded Fuels Reprocessing Plant.
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NUCLEAR POWER PLANTS
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Realistic Nucleon-Nucleon Forces and the Structure of Atomic Nuclei.
Juel-Spez-39 1258

NUCLEAR WASTES
Coal and Nuclear Wastes--Both Potential Contributors to Environmental and Health Problems.
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NUCLEI
Realistic Nucleon-Nucleon Forces and the Structure of Atomic Nuclei.
Juel-Spez-39 1258

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N82-11393/7 1254

NUMERICAL FLOW VISUALIZATION
A Wake Source Model for Asymmetric Potential Flow past Bodies of Wedge Shape.
N82-11036/2 1254

A Wake Source Model for Non-Symmetric Flow past Bluff Bodies in Two-Dimensional Flow.
N82-11037/0 1076

Generation of Axi-Symmetric Body Shapes in Subsonic Flow by Means of Polynomial Distributions of Sources and Doublets Along the Axis of Symmetry.
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HRP-0903693/0 1124

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HRP-0903698/9 1125

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HRP-0903699/7 1125

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HRP-0903700/3 1125

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HRP-0903702/9 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Indiana, Volume 15, Part 2.
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Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kansas, Volume 16, Part 1.
HRP-0903704/5 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kansas, Volume 16, Part 2.
HRP-0903705/2 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kentucky, Volume 17, Part 1.
HRP-0903706/0 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kentucky, Volume 17, Part 2.
HRP-0903707/8 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Louisiana, Volume 18, Part 1.
HRP-0903708/6 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Louisiana, Volume 18, Part 2.
HRP-0903709/4 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Massachusetts, Volume 21.
HRP-0903710/2 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Maine, Volume 19.
HRP-0903711/0 1126

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HRP-0903712/8 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Tennessee, Volume 42, Part 1.
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HRP-0903714/4 1127

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HRP-0903715/1 1127

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HRP-0903716/9 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Rhode Island, Volume 39.
HRP-0903717/7 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: South Carolina, Volume 40.
HRP-0903718/5 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: South Dakota, Volume 41, Part 1.
HRP-0903719/3 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: South Dakota, Volume 41, Part 2.
HRP-0903720/1 1127

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HRP-0903721/9 1128

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Vermont, Volume 45.
HRP-0903722/7 1128

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Texas, Volume 43, Part 1.
HRP-0903723/5 1128

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HRP-0903724/3 1128

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Texas, Volume 43, Part 3.
HRP-0903725/0 1128

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HRP-0903726/8 1128

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HRP-0903740/9 1129

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HRP-0903770/6 1129

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HRP-0903771/4 1129

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: New Hampshire, Volume 29.
HRP-0903772/2 1129

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: New York, Volume 32, Part 1.
HRP-0903773/0 1129

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HRP-0903774/8 1130

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HRP-0903775/5 1130

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HRP-0903776/3 1130

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: North Carolina, Volume 33, Part 1.
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NURSING HOMES

Evaluation of the Program of Nursing Services,
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PB82-139908 1134

Medicaid Nursing Home Reimbursement in Connecticut (Volume 6),
PB82-139916 1134

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PB82-139924 1134

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PB82-139932 1134

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Testing of RPMI-1640 as a Nutrient Medium for Fresh Semilunar Valve Storage.
AD-A106 824/6 1140

Efforts to Improve School Lunch Programs--Are They Paying Off.
AD-A106 829/5 1137

NUTRITION

GAO Comments on the Impact of the USDA Reorganization of Nutrition.
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The Effects of Diet Calcium, Protein and Acidity on Calcium Retention in the Rat, Particularly as Related to the Inner and Outer Surfaces of Tubular Bone: A Possible Model for the Treatment or Prevention of Osteoporosis.
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Nutrition Research--USSR,
AD-A107 335/2 1137

NUTRITIONAL DEFICIENCY DISEASES

Malnutrition: Immunological Aspects. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859323 1135

OAK TREES

Oak Management in California.
PB82-134453 1082

OBSCURATION

Field Experiments with Artificial Aerosols at San Nicolas Island, California.
AD-A107 270/1 1084

OCCUPATIONAL DISEASES

ORNL Coal Chemistry Report, 1979. Executive Summary.
ORNL-5629 1138

Occupational Injuries and Illnesses, Virgin Islands, 1979.
PB82-100033 1139

Occupational Injuries and Illnesses, Idaho, 1979.
PB82-100041 1139

Occupational Injuries and Illnesses, Wisconsin, 1979.
PB82-100058 1139

OCCUPATIONAL SAFETY

Guidance for Implementing an Environmental, Safety and Health Assurance Program. Volume 13. Model Guidelines for Line Organization Environmental, Safety and Health Meetings.
DE81030980 1138

Guidance for Implementing an Environmental, Safety and Health Assurance Program. Volume 12. Model Guidelines for Line Organization Environmental, Safety and Health Inspection and Monitoring Activities.
DE81030991 1138

OCCUPATIONAL SAFETY AND HEALTH

Occupational Injuries and Illnesses, Virgin Islands, 1979.
PB82-100033 1139

Occupational Injuries and Illnesses, Idaho, 1979.
PB82-100041 1139

Occupational Injuries and Illnesses, Wisconsin, 1979.
PB82-100058 1139

Industrial Hygiene Survey Report at Celotex Corporation, Pittston, Pennsylvania.
PB82-107103 1139

Asbestos Dust and Preliminary Industrial Hygiene Survey at World-Bestos, the Firestone Tire and Rubber Company in New Castle, Indiana.
PB82-107178 1139

Men's Apparel Industrywide Study at Gant Shirtmakers Division of Consolidated Foods, Salisbury, MD.
PB82-107186 1139

Industrial Hygiene Survey Report at U.S. Gypsum Corporation, Birmingham, Alabama.
PB82-107194 1139

Results of Air Samples of Johns-Manville in Marshville, North Carolina.
PB82-107202 1139

Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
PB82-107210 1139

Health Hazard Evaluation Report No. HE-79-14-760 at General Electric Company, Evendale,Ohio,
PB82-107228 1140

Health Hazard Evaluation Report No. HE-80-159-752 at Mountain Bell, Denver, Colorado,
PB82-107236 1140

Chloroacetaldehyde (Analytical Method S11).
PB82-107244 1140

Prevention of Low Back Injury in the Industrial Work Force: Symposium Held at Cincinnati, Ohio on November 9, 1972.
PB82-107251 1140

Men's Apparel Industrywide Study: Fechheimer Bros. Co., Cincinnati, Ohio.
PB82-107269 1140

An Analysis of the Scope of Federal Laws and Regulations Controlling Exposures to Substances Which Cause Occupational Respiratory and Pulmonary Diseases.
PB82-134198 1103

Preventive Medicine: Hazardous Materials Exposure and Public Health. 1976-1981 (Citations from the Energy Data Base).
PB82-859216 1135

OCCUPATIONAL SAFETY AND HEALTH ACT

Federal Employee Occupational Safety and Health Briefing for Management Officials.
DE82000706 1138

OCEAN CIRCULATION

Circulation and Trajectory Calculations in the Eastern Strait of Juan de Fuca Using a CODAR System,
PB82-134099 1156

OCEAN CURRENTS

Experience with an Expendable Temperature and Velocity Profiler.
AD-A106 914/5 1156

Oceanography of the Grand Banks Region of Newfoundland, March 1974 - October 1974.
AD-A107 452/5 1169

Circulation and Trajectory Calculations in the Eastern Strait of Juan de Fuca Using a CODAR System,
PB82-134099 1156

A Compilation of Moored Instrument Data and Associated Hydrographic Observations. Volume XXVIII (Polymode Local Dynamics Experiment, 1978-1979).
PB82-139411 1156

OCEAN DATA ACQUISITIONS SYSTEMS

Technology Transfer of NASA Microwave Remote Sensing System.
N82-11515/5 1228

OCEAN SURVEILLANCE

A high-Frequency Broadband Transmitter for Monostatic Systems.
AD-A107 088/7 1238

OCEAN THERMAL ENERGY CONVERSION

Economic Analysis of Ocean Thermal and Wind Power Plants and Power Generation. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
PB82-859737 1184

OCEAN THERMAL POWER PLANTS

Ocean Thermal Energy Conversion Preliminary Data Report for the February 1978 GOTEC-03 Cruise to the Gulf of Mexico, Mobile Site.
LBL-9438 1186

OCEAN WAVES

Prediction of Wave Refraction and Shoaling Using Two Numerical Models.
AD-A107 241/2 1156

OCEANOGRAPHIC DATA

Australian Oceanographic Data Centre. Bulletin 15.
AD-A107 118/2 1168

A Summary of Environmental Geologic Studies on the Southeastern United States Atlantic Outer Continental Shelf, 1977-1978.
PB82-109273 1158

ISLAS ORCADAS Cruise 16, April-May 1978. Hydrographic Stations 178-250.
PB82-140195 1168

South Atlantic OCS Physical Oceanography, Year II. Volume III: Data Products, Part I.
PB82-141888 1156

South Atlantic OCS Physical Oceanography, Year II. Volume III: Data Products, Part II.
PB82-141896 1156

KEYWORD INDEX

OCEANOGRAPHIC PARAMETERS
Technology Transfer of NASA Microwave Remote Sensing System.
N82-11515/5 1228

OCEANOGRAPHIC SURVEYS
St. Peter and St. Paul's Rocks (Equatorial Atlantic) and the Surrounding Sea Floor.
PB82-139403 1159

A Compilation of Moored Instrument Data and Associated Hydrographic Observations. Volume XXVIII (Polymode Local Dynamics Experiment, 1978-1979).
PB82-139411 1156

ISLAS ORCADAS Cruise 16, April-May 1978. Hydrographic Stations 178-250.
PB82-140195 1168

OCEANOGRAPHY
Proceedings of the Fourth Laser Hydrography Symposium 30 September - 3 October 1980 at Defence Research Centre, Salisbury, South Australia and Royal Australian Navy Hydrographic Office, North Sydney, New South Wales.
AD-A107 080/4 1168

OCEANS
Questions Concerning DOE's Assignment of Operating and Testing Responsibilities for OTEC-1.
AD-A106 860/0 1179

ODORANTS
Odorant Responses of Na(+) -K(+) ATPase Activity by Preparations from Paired Turbinals of Rat Olfactory Tissue.
AD-A107 102/6 1142

Effect of Antibody to Anisole Binding Protein on Odorant Perturbation of Na(+) -K(+) ATPase Activity.
AD-A107 162/0 1142

ODORS
Odorant Responses of Na(+) -K(+) ATPase Activity by Preparations from Paired Turbinals of Rat Olfactory Tissue.
AD-A107 102/6 1142

OFFICE BUILDINGS
Air Exchange Measurements in a High Rise Office Building.
PB82-133984 1226

OFFSHORE SITES
Bidding and Production Profiles for the Various Outer Continental Shelf Leasing Methodologies, 1954 to 1978.
LA-8497-MS 1182

OHIO
Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Ohio, Pennsylvania and West Virginia: Canton Quadrangle. Final Report.
GJBX-92(80)(V.2A) 1165

Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Ohio and West Virginia: Charleston Quadrangle. Final Report.
GJBX-92(80)(V.2D) 1165

Case Studies of the Impact of Federal Aid on Major Cities: City of Cleveland.
PB82-131558 1114

OIL POLLUTION
A Summary of Environmental Geologic Studies on the Southeastern United States Atlantic Outer Continental Shelf, 1977-1978.
PB82-109273 1158

Marine Bird Populations of the Strait of Juan de Fuca, Strait of Georgia and Adjacent Waters in 1978 and 1979.
PB82-132622 1155

Evaluation of Existing Marine Intertidal and Shallow Subtidal Biologic Data.
PB82-134065 1155

Circulation and Trajectory Calculations in the Eastern Strait of Juan de Fuca Using a CODAR System.
PB82-134099 1156

Alaska OCS Socioeconomic Studies Program: St. George Basin and North Aleutian Shelf Commercial Fishing Industry Analysis.
PB82-139817 1122

Distribution and Abundance of Marine Birds and Mammals Wintering in the Kodiak Area of Alaska.
PB82-140187 1155

Proceedings: Annual Gulf of Mexico Information Transfer Meeting (2nd) Held in New Orleans, Louisiana, 1980.
PB82-146333 1155

OIL SAND INDUSTRY
Water Availability for Development of Major Tar Sands Areas in Utah.
LETC-0013-1 1166

OIL SHALES
The Oil Shale Corporation Loan Guarantee Contract.
AD-A106 887/3 1180

Fractionation of Diesel Fuel from Petroleum and Paraho Shale Oils.
AD-A107 042/4 1266

Investigation of Factors Affecting the in-Situ Combustion Retorting of Oil Shale. Final Report.
DE82000482 1161

Partitioning of Major, Minor, and Trace Elements During Simulated in-Situ Oil Shale Retorting.
LBL-9062 1151

OIL SPILLS
Proposed Gulf of Mexico OCS Oil and Gas Sales 67 and 69.
PB82-109430 1210

Circulation and Trajectory Calculations in the Eastern Strait of Juan de Fuca Using a CODAR System.
PB82-134099 1156

Proceedings: Annual Gulf of Mexico Information Transfer Meeting (2nd) Held in New Orleans, Louisiana, 1980.
PB82-146333 1155

OILS
The United States Remains Unprepared for Oil Import Disruptions. Volume I. Summary: Includes Conclusions and Recommendations.
AD-A106 921/0 1180

The United States Remains Unprepared for Oil Import Disruptions. Volume II. Detailed Review of Current Emergency Programs and Alternative Approaches.
AD-A106 922/8 1180

Rice Bran and Rice Bran Oil: Food Processing. 1972-1981 (Citations from the Food Science and Technology Abstracts Data Base).
PB82-857194 1138

OLFACTORY SYSTEM
Odorant Responses of Na(+) -K(+) ATPase Activity by Preparations from Paired Turbinals of Rat Olfactory Tissue.
AD-A107 102/6 1142

Effect of Antibody to Anisole Binding Protein on Odorant Perturbation of Na(+) -K(+) ATPase Activity.
AD-A107 162/0 1142

OMNITAB 80 SYSTEMS
Test Problems and Results for OMNITAB 80.
PB82-136474 1176

ON-LINE SYSTEMS
Automated Water Monitor System Field Demonstration Test Report. Volume 2: Technical Summary.
N82-11992/6 1209

ONTOGENY
Ontogeny of Respiratory and Growth Responses of Larval Mud Crabs Rhithropanopeus harrisii Exposed to Different Temperatures, Salinities and Naphthalene Concentrations.
AD-A107 022/6 1155

OOCYTES
Seed-Protein Genes and the Regulation of Their Expression. Progress Report.
DE81030165 1120

OPERATING COSTS
User Charge Revenues for Wastewater Treatment Plants--Insufficient to Cover Operation and Maintenance.
PB82-137761 1215

OPERATIONAL READINESS
An Approach for Assessing Missile System Dormant Reliability.
AD-A107 519/1 1232

OPERATORS (MATHEMATICS)
Value Theory without Efficiency.
AD-A107 085/3 1199

OPTICAL COMMUNICATION
InGaAsP/InP Laser Development for Single-Mode, High-Data-Rate Communications.
N82-11452/1 1255

OPTICAL COMMUNICATIONS
Communications through a Randomly Dispersive Incoherent Optical Channel.
AD-A107 052/3 1233

OPTICAL CONNECTORS
Connectors for Fiber Optics. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-859646 1257

OPTICAL DETECTION
A 10.6 micrometer Amplitude Modulated Telemeter Laser with Nonlinear Postdetection: Study of a Single Laser System--Translation.
AD-A107 475/6 1256

OPTICAL DETECTORS
Development of an Electronic Interface for a Fiber Optic Interferometric Sensor.
AD-A107 261/0 1237

OPTICAL GLASS
Predicting Failure of Optical Glass Fibers.
AD-A107 245/3 1189

OPTICAL INTERFEROMETERS
Development of an Electronic Interface for a Fiber Optic Interferometric Sensor.
AD-A107 261/0 1237

OPTICAL MEASURING INSTRUMENTS
Engineering Aspects of Gradient-Index Optical Systems.
PB82-131996 1256

OPTICAL PROPERTIES
Atmospheric Turbulence as a Function of Height above Various Surface Materials.
AD-A107 034/1 1085

An Analysis of Haze Effects on Landsat Multispectral Scanner Data.
N81-29497/7 1080

OPTICAL PUMPING
Investigation of Direct Solar-to-Microwave Energy Conversion Techniques.
N82-11544/5 1186

Active Lamp Pulse Driver Circuit.
PAT-APPL-6-276 748 1179

OPTICAL RADAR
Proceedings of the Fourth Laser Hydrography Symposium 30 September - 3 October 1980 at Defence Research Centre, Salisbury, South Australia and Royal Australian Navy Hydrographic Office, North Sydney, New South Wales.
AD-A107 080/4 1168

Fiber-Coupled External-Cavity Semiconductor High-Power Laser.
AD-A107 227/1 1255

OPTICAL SCANNING
Laser Photoacoustic Technique for NDE.
AD-A107 388/1 1228

OPTICAL TRACKING
Maui Optical Tracking and Identification Facility Transition Program.
AD-A106 997/0 1273

Machine Intelligence Research Applied to Industrial Automation.
PB82-133075 1222

OPTIMAL CONTROL
Theory and Applications of Optimal Control in Aerospace Systems.
AD-A106 937/6 1078

An Algorithm for Minimum-Cost Set-Point Ordering in a Cryogenic Wind Tunnel.
N82-11090/9 1228

OPTIMIZATION
An Exact Penalty Function Algorithm for Optimal Control Problems with Control and Terminal Equality Constraints. Part 1.
AD-A107 275/0 1197

Optimization of Performance of Arc Welding Using Fluxes in Welded Ship Structures from HY-100 and HY-130 KPSI.
AD-A107 341/0 1222

Algorithm for Fuel Conservative Horizontal Capture Trajectories.
N82-11018/0 1076

ORAL DISEASES
Dental Emergencies Occurring among U.S. Army Recruits.
AD-A107 271/9 1123

ORAL HEALTH
Evaluation of the Effectiveness and Efficiency of Preventive Dentistry Programs: Assessment of the Relationship between Past Dental Experience and Dental Sick Call in the Field.
AD-A107 506/8 1124

ORBIT TRANSFER VEHICLES
Analysis of Space Systems Study for the Space Disposal of Nuclear Waste Study Report. Volume 2: Technical Report.
N82-11889/4 1245

ORBITAL LAUNCHING
Mission Operation Report: Rca-D/delta Launch.
N82-11102/2 1273

ORBITAL SPACE STATIONS
Technology for Large Space Systems: A Special Bibliography.
N82-11093/3 1272

OREGON
A Study of the Invertebrates and Fishes of Salt Marshes in Two Oregon Estuaries.
AD-A106 973/1 1155

National Hydroelectric Power Resources Study. Preliminary Inventory of Hydropower Resources. Volume 1. Pacific Northwest Region.
DOE/RA/11025-T1(V.1) 1186

ORES (METAL SOURCES)
Improvements in Department of the Interior Leasing of Potential Aluminum Resources Are Necessary for More Timely Decisionmaking.
AD-A106 886/5 1191

Follow-up Report on Domestic Aluminum Resources: Dilemmas of Development.
AD-A106 901/2 1191

ORGANIC COMPOUNDS
Chemicals Identified in Human Biological Media.
DE81030813 1141

NRCC Software Catalog. Volume 1.
LBL-10811 1174

Performance Tests for the Evaluation of Computerized Gas Chromatography/Mass Spectrometry Equipment and Laboratories.
PB82-137662 1229

ORGANIC SOLVENTS
EDS Coal-Liquefaction Process Development. Phase V. Monthly Technical Progress Report, March 1-March 31, 1981.

DOE/ET/10069-T7(V.1) 1146

ORGANIC SULFUR COMPOUNDS
Impact of Energy-Related Pollutants on Chromosome Structure. Progress Report, January 1, 1981-December 31, 1981.
DE82000153 1121

ORGANIZATIONS
Effect of Work Schedule, and Description of Career Intention on Organizational Effectiveness.
AD-A106 819/6 1105

Effect of Number Supervised and Educational Level on Organizational Effectiveness.
AD-A106 820/4 1105

Systems Are Not Solutions: Issues in Creating Information Systems That Account for the Human Organization.
AD-A106 866/7 1094

Unresolved Issues Remain Concerning U.S. Participation in the International Energy Agency.
AD-A106 879/0 1102

ORGANIZED CRIME
Stronger Federal Effort Needed in Fight Against Organized Crime.
PB82-139148 1115

ORGANOMETALLIC COMPOUNDS
Palladium-Catalyzed Coupling Reactions: Mechanism of Reductive Elimination. Progress Report, October 1, 1980-June 30, 1981.
DE81030169 1150

ORR REACTOR
Oak Ridge Research Reactor Quarterly Report, July, August, and September of 1980.
DE81030702 1247

ORTHENE
Field Evaluation of Phloem-Mobile Acephate for Suppression of Southern Pine Beetle.
PB82-134479 1082

ORTHO HYDROGEN
Cooling by Conversion of Para to Ortho-Hydrogen.
PAT-APPL-6-301 075 1152

ORTHO PARA CONVERSION
Cooling by Conversion of Para to Ortho-Hydrogen.
PAT-APPL-6-301 075 1152

ORTHOPLASTY
Orthoplasty for Bile Duct Stricture at the Liver Hilum, A Preliminary Report of 5 Cases,
PB82-129727 1131

OSTEOPOROSIS
The Effects of Diet Calcium, Protein and Acidity on Calcium Retention in the Rat, Particularly as Related to the Inner and Outer Surfaces of Tubular Bone: A Possible Model for the Treatment or Prevention of Osteoporosis.
AD-A107 200/8 1123

OSWATISCH INLETS
Performance of an Oswatisch Inlet with Hemispherical Centerbody at Zero Angle of Attack.
AD-A107 439/2 1270

OUTER CONTINENTAL SHELVES
A Summary of Environmental Geologic Studies on the Southeastern United States Atlantic Outer Continental Shelf, 1977-1978.
PB82-109273 1158

Alaska OCS Socioeconomic Studies Program: St. George Basin and North Aleutian Shelf Commercial Fishing Industry Analysis.
PB82-139817 1122

Distribution and Abundance of Marine Birds and Mammals Wintering in the Kodiak Area of Alaska.
PB82-140187 1155

South Atlantic OCS Physical Oceanography, Year II. Volume III: Data Products, Part I.
PB82-141888 1156

South Atlantic OCS Physical Oceanography, Year II. Volume III: Data Products, Part II.
PB82-141896 1156

OUTER SPACE TREATY
Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.
N82-11989/2 1103

OVENS
Commercial Cooking Equipment Improvement. Volume I: Range Ovens.
PB82-141060 1202

OVER THE HORIZON DETECTION
Continental United States Over-The-Horizon-Backscatter (OTH-B) Radar System. Supplement.
AD-A106 870/9 1237

OVERHEAD POWER TRANSMISSION
Overhead Power Transmission. 1976-1981 (Citations from the Energy Data Base).
PB82-859513 1179

OVERSEAS
Management of the Department of State Office of Passport Services Needs to be Improved.
AD-A106 880/8 1088

OWNERSHIP
The Role of an Understanding of Social Factors in Forecasting Car Ownership,
PB82-135773 1221

OXADIAZOLES
Chemistry of Aryloxazolines. Applications to the Synthesis of Lignan Lactone Derivatives.
AD-A107 224/8 1147

OXIDATION
Preparation and Characterization of Neutral and Oxidized Polypyrrole Films.
AD-A107 166/1 1195

The Oxidation and Corrosion Resistance of Nitrided Iron Alloys.
AD-A107 516/7 1192

OXIDATION REDUCTION REACTIONS
Competitive Pathways in Chlorine Dioxide Oxidation of Amines: Amide Formation from Acyclic Amines.
AD-A107 242/0 1147

OXIDATION RESISTANCE
Silicon Carbide as an Oxidation-Resistant High-Temperature Material. 1: Oxidation and Heat Corrosion Behavior.
N82-11120/4 1189

OXIDE NUCLEAR FUELS
Simulation of the Chemical State of Irradiated Oxide Fuel; Influence of the Internal Corrosion on the Mechanical Properties of Zry-4 Tubing.
KFK-2785 1247

OXIDIZERS
Burning Rate Maximum of a Plane Premixed Flame.
AD-A107 163/8 1264

OXYGEN
Nuclear Materials Research Progress Reports for 1979.
LBL-11030 1249

Excitation of the O(2)(a sup 1 delta(g)) State by Low Energy Electrons.
PB82-133851 1152

Oxygen Dynamics Study - Susquehanna River Below Conowingo Dam, Maryland: Volume I.
PB82-135971 1136

OXYGEN 16 TARGET
Polarization Transfer in Inelastic Scattering.
LA-UR-80-2427 1259

OZONE
Questions and Responses at the 1981 Workshops on Procedures to Demonstrate Attainment of the NAAQS (National Ambient Air Quality Standards) for Ozone in the 1982 SIPs (State Implementation Plans).
PB82-107863 1210

P TYPE SEMICONDUCTORS
Inter-Soliton Electron Hopping Transport in Trans-(CH)x.
AD-A106 966/5 1263

GaAs Shallow-Homojunction Solar Cells on Ge-Coated Si Substrates.
AD-A107 056/4 1184

PACEMAKER TECHNOLOGY
Cardiac Pacemakers. 1976-1981 (Citations from the Energy Data Base).
PB82-859950 1141

PACEMAKERS
A Profile of the Medical Technology Industry and Governmental Policies: A Study of the Effects of Medicare/Medicaid Reimbursement and the 1976 Medical Device Amendments on the Pacemaker Industry. Volume II.
PB82-141839 1100

PACIFIC OCEAN
Crustal Structure of the Shatsky Rise from Seismic RefractiON Measurements.
AD-A107 027/5 1157

Geoacoustic Modeling of Deep-Sea Carbonate Sediments,
AD-A107 028/3 1168

PACKAGING
Cold Setting Glue for Packaging. 1976-1981 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
PB82-859836 1189

Boxboard Gluer: Scoring, Folding and Sealing Paperboard Cartons. 1976-1981 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
PB82-859844 1220

PAKISTAN
Pakistan's Foreign Relations,
AD-A107 113/3 1102

PALLADIUM COMPLEXES
Palladium-Catalyzed Coupling Reactions: Mechanism of Reductive Elimination. Progress Report, October 1, 1980-June 30, 1981.
DE81030169 1150

PANORAMIC PHOTOGRAPHS
Predictability of Dental Emergencies by Panography.
AD-A107 272/7 1123

PANTEX PLANT
Aerial Radiological Survey of the United States Department of Energy's Pantex Plant and Surrounding Area Amarillo, Texas. Date of Survey: October 1979.
DE82000434 1246

PAPER INDUSTRY
Scavenging of Aerosol Particles by Precipitation.
PB82-134404 1213

Pulp/Paper Mill Dust Fires. 1974-1981 (Citations from the Institute of Paper Chemistry Data Base).
PB82-858929 1225

Dust Control in Pulp/Paper Mills. 1972-1981 (Citations from the Institute of Paper Chemistry Data Base).
PB82-859257 1196

Dust Control in Pulp/Paper Mills. 1976-1981 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
PB82-859273 1196

PAPERBOARDS
Cold Setting Glue for Packaging. 1976-1981 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
PB82-859836 1189

Boxboard Gluer: Scoring, Folding and Sealing Paperboard Cartons. 1976-1981 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
PB82-859844 1220

PAPERWORK REDUCTION ACT
Records Filing, Maintenance and Disposition Study for Department of the Army.
AD-A107 079/6 1094

PARA HYDROGEN
Cooling by Conversion of Para to Ortho-Hydrogen.
PAT-APPL-6-301 075 1152

PARABOLIC ANTENNAS
Focal Axis Resolver for Offset Reflector Antennas.
PAT-APPL-6-308 009 1179

PARABOLIC TROUGH COLLECTORS
Near-Term Improvements in Parabolic Troughs: An Economic and Performance Assessment.
DE82001158 1200

Preliminary Definition and Characterization of a Solar Industrial Process Heat Technology and Manufacturing Plant for the Year 2000.
LA-8137-TASE 1182

PARALLEL PROCESSING
Performance Evaluation of Linear Algebra Software in Parallel Architectures.
LA-8078-MS 1173

Design Concepts for a Hierarchical Two Dimensional Multiprocessor Structure,
PB82-135633 1176

Simulation of a Two-Dimensional Multiprocessor Structure,
PB82-136953 1177

PARALLEL PROCESSING (COMPUTERS)
SAR Processing on the MPP.
N82-11801/9 1174

PARAMETER IDENTIFICATION
Parametric Study of Microwave-Powered High-Altitude Airplane Platforms Designed for Linear Flight.
N82-11050/3 1077

Nonparametric Identification of a Class of Nonlinear Close-Coupled Dynamic Systems.
N82-11098/2 1272

Parameter Estimation of Large Flexible Aerospace Structures with Application to the Control of the Maypole Deployable Reflector.
N82-11099/0 1272

Modulation/Demodulation Techniques for Satellite Communications. Part 4: Appendices.
N82-11341/6 1234

PARAMETRIC ANALYSIS
Parametric Interaction and Spatial Collapse of Beam-Driven Langmuir Waves in the Solar Wind.
AD-A107 217/2 1082

A Comparison of Procedures for Constructing Large Item Pools.
AD-A107 364/2 1197

PARASITIC DISEASES
International Symposium on Nuclear Techniques in the Study and Control of Parasitic Diseases of Man and Animals.
AD-A107 302/2 1123

PARKS
Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume IV: The Mobile Home Park System,
PB82-144353 1100

PARTICLE SIZE DISTRIBUTION
Scavenging of Aerosol Particles by Precipitation.
PB82-134404 1213

PARTICLE TRAJECTORIES
Gravitational Effects on Particle Motions. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
PB82-859695 1260

PARTICULATES
Health Hazard Evaluation Report No. HE-79-14-760 at General Electric Company, Evendale,Ohio,
PB82-107228 1140

Chemical Analysis of Aerosols and Airborne Particulates. 1977-June, 1980 (Citations from the NTIS Data Base).

PB82-802422 1154

Chemical Analysis of Aerosols and Airborne Particulates. July, 1980-November, 1981 (Citations from the NTIS Data Base).
PB82-802430 1154

PASSENGER AIRCRAFT
Lightweight Diesel Engine Designs for Commuter Type Aircraft.
N82-11068/5 1271

PASSENGER CAR TIRES
Automobile Tires. April, 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859802 1222

PASSIVE IMMUNITY
Colostrum: Immunological Aspects. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859588 1135

PASSIVE SOLAR HEATING SYSTEMS
Passive Design for a Manufactured Classroom Building. Final Report.
DE81030496 1200

Passive Solar Working for You Naturally: Information Manual.
DE81030947 1200

Passive-Solar Retrofit Concepts.
DE82000453 1200

Passive-Solar Multi-Family Concepts.
DE82000456 1200

Passive Design Tutorial.
ISM-227 1201

Solar Energy Research at LASL. Progress Report, April 1-September 30, 1979.
LA-8283-PR 1201

Survey of Passive Solar Buildings.
PB82-144684 1203

PASSIVE SONAR
Underwater Target Tracking Using Measurements from a Linear Array of Omnidirectional Acoustic Elements.
AD-A107 070/5 1232

PASSIVITY
Corrosion Protection of Metals and Metal Alloys. 1976-1981 (Citations from the Energy Data Base).
PB82-858986 1193

PATERNO DAM
National Dam Safety Program. Paterno Dam (Inventory Number N.Y. 101), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 401/2 1206

PATIENTS
Patient Tracking for High Blood Pressure Control.
PB82-107525 1130

PATTERN RECOGNITION
Geophysical Signal Recognition.
AD-A107 005/1 1168

An Application of Syntactic Pattern Recognition to Seismic Discrimination,
AD-A107 383/2 1238

Image Segmentation with Color and Texture,
AD-A107 479/8 1173

Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236

Maximum Likelihood Clustering with Dependent Feature Trees.
N81-29502/4 1198

Evaluation of Large Area Crop Estimation Techniques Using Landsat and Ground-Derived Data.
N81-29511/5 1081

PATTERN REGISTRATION
Evaluation of Multiband, Multitemporal, and Transformed Landsat Mss Data for Land Cover Area Estimation.
N81-29496/9 1080

PAVEMENT BASES
The Resilient and Plastic Characteristics of Michigan Subgrade Soils and Their Soil Support Values.
PB82-109570 1170

PAVEMENT MARKING
Epoxy Thermoplastic Pavement Marking Material: Specification and Testing.
PB82-135914 1214

PAVEMENT MARKINGS
Yellow Bar Experimental Carriageway Markings - Accident Study,
PB82-135328 1225

PAVEMENTS
A Statistical Evaluation of Soil and Climatic Parameters Affecting the Change in Pavement Deflection during Thawing of Subgrades,
AD-A106 976/4 1204

Collection and Use of Pavement Condition Data.
PB82-131970 1212

Recommendations for Road Surface Dressing.
PB82-132630 1219

Development of a Test Trailer for High-Volume Skid-Resistance Surveys.
PB82-135872 1214

Epoxy Thermoplastic Pavement Marking Material: Specification and Testing.
PB82-135914 1214

PAYLOAD DELIVERY (STS)
Analysis of Space Systems Study for the Space Disposal of Nuclear Waste Study Report. Volume 2: Technical Report.
N82-11889/4 1245

PAYMENT
National Monthly Medicaid Statistics, April 1979.
PB82-135815 1132

PDP 11 COMPUTER
Digital Ultrasonics Signal Processing: Flaw Data Post Processing Use and Description.
N82-11862/1 1228

PEACEKEEPING MISSIONS
U.S. Role in Sinai Important to Mideast Peace.
AD-A106 899/8 1102

PEAK DISCHARGE
Selected Hydrologic Relationships for Soldier Creek, Northeastern Kansas.
PB82-138751 1160

PEAK LOAD
Saving Half of California's Energy and Peak Power in Buildings and Appliances Via Long-Range Standards and Other Legislation.
LBL-6865 1182

PEANUTS
Information on Peanut Allotment Owners that Lease and Rent Away Rather Than Plant Their Peanut Allotments/Quotas.
AD-A107 377/4 1079

PEAT
Environmental Impacts Associated with Using Peat for Energy.
DE81032000 1209

Peat Resource Evaluation: State of Maine. Report for the Quarter Ending August 1981.
DE82000227 1157

PEDIATRICS
Fathering and the Pediatric Cancer Experience.
AD-A106 945/9 1122

PEER REVIEW
Design of an Evaluation of PSRO Long-Term Care Review.
PB82-131616 1132

Peer Review,
PB82-135237 1132

PENALTIES
Improvements Needed in Assessing Penalties and Controlling Penalty Collections Resulting from Occupational Safety and Health Inspections.
AD-A106 848/5 1138

PENETRATION
Pore Size, Zinc Penetration, and Zinc Diffusion Studies on PPQ/CA Separators.
AD-A107 354/3 1187

PENETROMETERS
Static Penetrometer for Soft and Loose Soils (Penetrometro Estatico Para Suelos Blandos Y Sueltos),
PB82-135401 1170

PENNSYLVANIA
Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Ohio, Pennsylvania and West Virginia: Canton Quadrangle. Final Report.
GJBX-92(80)(V.2A) 1165

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Pennsylvania, Volume 38, Part 1.
HRP-0903715/1 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Pennsylvania, Volume 38, Part 2.
HRP-0903716/9 1127

Population-Based Mental Health Needs Assessment Methodology for Use in HSA/SP.
HRP-0903747/4 1129

PENSIONS
Future of State and Local Pensions.
PB82-144494 1111

PEPTIDE HYDROLASES
Staphylococcus Aureus Protease: A Probe of Exposed, Non-Basic Histone Sequences in Nucleosomes.
DE81030486 1120

PERCEPTION
Target Information Processing: The Effects on Reaction Time of Terrain, Downlook Angle, and Response Processing Level.
AD-A107 295/8 1111

Perception of Rape: Influence on Causal Attributions,
PB82-133778 1112

PERFORMANCE (ENGINEERING)
A Statistical Methodology for Constructing Synthetic Test Workloads.
AD-A107 257/8 1172

Effect of Operator Mental Loading on Voice Recognition System Performance.
AD-A107 477/2 1234

PERFORMANCE EVALUATION
Peer Review,
PB82-135237 1132

Final Results of the 'One Week Follow-Up' with Participants during the FY79 and FY80 Emission Factor Testing Programs.
PB82-139494 1222

PERFORMANCE (HUMAN)
Comparisons of Performance Effectiveness Among Divers.
AD-A106 912/9 1106

The Formation of Homogeneous Item Sets When Guessing is a Factor in Item Responses.
AD-A107 134/9 1111

Problems with the Small Business Administration's Merit Appraisal and Compensation System.
AD-A107 181/0 1107

Performance as a Factor in Enlisted Promotions.
AD-A107 298/2 1108

On the Design of Simulations of Command and Control Processes.
AD-A107 423/6 1108

Some Guidelines for Effective Task Design in Command and Control Simulations.
AD-A107 424/4 1108

PERFORMANCE PREDICTION
Parametric Study of Microwave-Powered High-Altitude Airplane Platforms Designed for Linear Flight.
N82-11050/3 1077

The Effects of Impurities on the Performance of Silicon Solar Cells.
N82-11548/6 1187

Jet Impingement Heat Transfer Enhancement for the GPU-3 Stirling Engine.
N82-11993/4 1271

PERFORMANCE STANDARDS
Methods and Standards System.
PB82-121799 1091

Methods and Standards System. Computer Operation Manual.
PB82-121807 1091

PERFORMANCE TESTS
Evaluation of the Micro-Carburetor.
N82-11994/2 1271

Directory of Information for Dynamometer Testing of 1979-1981 Light Duty Motor Vehicles,
PB82-106873 1221

PERIODICALS
Terrorism; A Bibliography of Books and Periodical Articles.
AD-A107 291/7 1232

Scanning Electron Microscopy/1981/III. An International Journal of Scanning Electron Microscopy, Related Techniques, and Applications. Part III,
AD-A107 525/8 1140

Natural Hazards Observer Index. Volume 1, Number 1-Volume 4, Number 3.
PB82-132663 1114

Business America - The Magazine of International Trade, Volume 4, Number 24, November 30, 1981.
PB82-134321 1099

Business America - The Magazine of International Trade, Volume 4, Number 25, December 14, 1981.
PB82-137498 1100

PERITONEAL DIALYSIS
Method for Continuous Ambulatory Peritoneal Dialysis.
PATENT-4 239 041 1140

PERMANENT MAGNETS
Investigation for Low-Cost Permanent Magnets.
AD-A107 392/3 1171

PERSONAL HEALTH SERVICES
Mental Health Services: Personal Health Care. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802356 1135

PERSONNEL
Directory of Soviet Officials: Republic Organizations.
PB81-928110 1095

Profiles of Basotho Farmers. Part I: Images of Basotho Farmers. Part II: Are the Basotho Subsistence Farmers. Part III: Progressive Farmers in Lesotho.
PB82-132762 1109

Civil Service Reform After Two Years: Some Initial Problems Resolved but Serious Concerns Remain.
PB82-134131 1110

Artists' Spaces: A Study of the Development of Artists' Living and Working Space in Boston,
PB82-144650 1116

PERSONNEL DEVELOPMENT
Avionic Communications and Avionic Navigation Systems Specialties AFS 328X0 and 328X1.
AD-A107 115/8 1107

PERSONNEL MANAGEMENT
Tightening Eligibility Standards Could Cut Involuntary Retirement Costs by Millions of Dollars.
AD-A106 842/8 1105

Serious Problems Need to be Corrected before Federal Merit Pay Goes into Effect.
AD-A106 843/6 1105

An Appraisal of Performance Appraisal Summary Results of a Large Scale Study.
AD-A106 865/9 1105

Limits on Receipt of Multiple Disability Benefits Could Save Millions.
AD-A106 874/1 1106

Obstacles Hamper the Office of Personnel Management's Evaluation of the Implementation of the 1978 Civil Service Reform Act.
AD-A107 180/2 1107

Problems with the Small Business Administration's Merit Appraisal and Compensation System.
AD-A107 181/0 1107

Fewer Agent Transfers Should Benefit the FBI and Its Agents as Well as Save Money.
AD-A107 183/6 1107

Review of Circumstances of the Mass Removal of Statutory Inspectors General.
AD-A107 189/3 1108

Social Security Administration Policies for Managing Its Administrative Law Judges.
AD-A107 191/9 1108

The Veterans Administration's Efforts to Consolidate Computer Programming Resources at a Single Location.
AD-A107 197/6 1108

Mission Impact Generalized Explanatory Base Operating Support Model Development: Final Management Summary.
AD-A107 277/6 1089

PERSONNEL RETENTION

Air War College Class of 1981 Retention Survey.
AD-A107 103/4 1107

The Determinants of Career Decisions of Air Force Pilots.
AD-A107 265/1 1108

Military Retention and Retirement. Reciprocal Family/Organization Effects,
AD-A107 349/3 1113

A Descriptive Analysis of First Term Attrition from U.S. Naval Ships.
AD-A107 510/0 1109

PERSONNEL SELECTION

An Approach to Selecting Panels of Experts,
PB82-139569 1110

The Delphi Technique: Analysis of Responses to a Survey of Children's Mental Health Services Development,
PB82-139577 1110

An Approach to Identifying Objectives for Targeted Research Programs,
PB82-139585 1111

PERTURBATIONS

Two New Bifurcation Phenomena.
AD-A107 011/9 1196

PESTICIDES

Chemicals Identified in Human Biological Media.
DE81030813 1141

Treatability Studies of Pesticide Manufacturing Wastewaters: Ethylenebisdithiocarbamate Fungicides.
PB82-107566 1210

Methyl Parathion Persistence in Soil Following Simulated Spillage.
PB82-127549 1170

Marine and Estuarine Pollution.
PB82-128174 1136

Pesticide Registration Standard: Isopropalin.
PB82-131293 1136

Dialifor (O, O-diethyl S-(2-chloro-1-phthalimidoethyl) phosphorodithioate): Pesticide Registration Standard.
PB82-133638 1145

Initial Toxicological Assessment of Ambush, Bolero, Bux, Dursban, Fentrifanil, Larvin, and Pydrin: Static Acute Toxicity Tests with Selected Estuarine Algae, Invertebrates, and Fish.
PB82-137654 1145

Naphthalene: Pesticide Registration Standard.
PB82-139437 1136

TEMEPHOS: O,O'-(thiodi-4,1-phenylene) bis(O,O-dimethyl phosphorothioate), Pesticide Registration Standard.
PB82-140641 1216

PETROLEUM

Fossil Energy Program. Quarterly Progress Report for the Period Ending June 30, 1981.
DE82000505 1268

Environmental Assessment: Allocation of Petroleum Feedstock, Columbia LNG Corporation, Green Springs SNG Plant, Green Springs, Seneca County, Ohio.
DOE/EA-0061 1209

State Flows of Energy in 1975.
ORNL/TM-6977 1183

PETROLEUM DEPOSITS

Bidding and Production Profiles for the Various Outer Continental Shelf Leasing Methodologies, 1954 to 1978.
LA-8497-MS 1182

PETROLEUM INDUSTRY

The United States Remains Unprepared for Oil Import Disruptions. Volume II. Detailed Review of Current Emergency Programs and Alternative Approaches.
AD-A106 922/8 1180

Strategies for State Participation in OCS Exploration Decisions: Onshore Facilities Related to Offshore Oil and Gas Development.
PB82-136482 1184

PETROLEUM PIPELINES

Regional Pipeline Environmental Assessment Record: An Aggregate Analysis of Major Areas of Pipeline Concern and Impact on the Outer Continental Shelf (Gulf of Mexico).
PB82-131301 1211

PETROLEUM PRODUCTS

Status of Strategic Petroleum Reserve Activities--July 1981.
AD-A106 923/6 1266

Fractionation of Diesel Fuel from Petroleum and Paraho Shale Oils.
AD-A107 042/4 1266

Status of Strategic Petroleum Reserve Activities.
AD-A107 373/3 1266

State Flows of Energy in 1975.
ORNL/TM-6977 1183

PETROLEUM REFINING

Waste Processing and Pollution in the Chemical and Petrochemical Industries. 1978-June, 1980 (Citations from the NTIS Data Base).
PB82-802661 1147

Waste Processing and Pollution in the Chemical and Petrochemical Industries. July, 1980-November, 1981 (Citations from the NTIS Data Base).
PB82-802679 1147

PETROLOGY

Meteorites. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-858028 1159

PHASE CHANGE SALTS

Thermal Energy Storage: Glauber's Salt. 1976-1981 (Citations from the Energy Data Base).
PB82-859091 1189

PHASE TRANSFORMATIONS

The Nature of the Phase Transition Observed for Monolayers of Azulene on Pt(III).
AD-A107 067/1 1148

PHENOLS

Evaluation of Gamma Radiation for Destruction of Pentachlorophenol in Aqueous Solution and on Activated Carbon.
AD-A106 943/4 1154

PHOSPHATE GLASS

Aqueous Dissolution of Calcium Metaphosphate Glasses.
DE81030130 1189

PHOSPHORIC ACID/FLUORO

Comparison of the Caries-Preventive Effects of Neutral Sodium Fluoride and Acidulated Phosphate Fluoride.
PB82-135203 1132

PHOSPHORIC ACID FUEL CELLS

Survey on Aging on Electrodes and Electrocatalysts in Phosphoric Acid Fuel Cells.
N82-11545/2 1186

PHOSPHORUS

Limnological Investigations: Lake Koocanusa, Montana. Part 5. Phosphorus Chemistry of Sediments.
AD-A107 049/9 1159

PHOTOCHEMICAL REACTION

Photopolymerization. 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859182 1148

PHOTOCHEMISTRY

Radiation Laboratory, University of Notre Dame. Quarterly Report, April 1, 1981-June 30, 1981.
DE81030942 1155

PHOTOCONDUCTIVITY

Industry Views on the Ability of the U.S. Photovoltaics Industry to Compete in Foreign Markets.
AD-A106 881/6 1097

Photoconductivity in Polyacetylene.
AD-A106 965/7 1194

PHOTOELASTICITY

Dynamic Crack Curving - A Photoelastic Evaluation.
AD-A107 238/8 1262

New Molding Method of Three-Dimensional Hollow Photoelastic Model and Centrifugal Stress Analysis of Air Cooled Turbine Blade Model.
N82-11067/7 1270

PHOTOELECTRIC CELLS (SEMICONDUCTOR)

Accelerated Stress Testing of Solar Photovoltaic Modules.
AD-A107 378/2 1184

Effects of Temperature on Excited-State Descriptions of Luminescent Photoelectrochemical Cells Employing Tellurium-Doped Cadmium Sulfide Electrodes.
AD-A107 544/9 1150

PHOTOELECTRON SPECTROSCOPY

ESCADT: A FORTRAN Code for Computing the Positions and Areas of X-Ray Photoelectron Spectral Peaks.
LA-7910 1263

PHOTOGRAPHIC IMAGES

Optical Processing of Photographic Images.
AD-A107 212/3 1230

PHOTOGRAPHIC TEXTURE

Image Segmentation with Color and Texture,
AD-A107 479/8 1173

PHOTOINTERPRETERS

Determination of the Relationship between Information Capacity and Identification by Simulated Aerial Photography.
AD-A107 485/5 1230

PHOTOMICROGRAPHY

Veterans Administration's Efforts to Improve the Management of Paper Records in the Department of Veterans Benefits. A Major System Acquisition Project.
AD-A107 192/7 1095

PHOTON EMISSION

Time Correlation in Two-Photon Decay.
KFKI-1979-78 1259

PHOTON-PHOTON INTERACTIONS

Review on Photon-Photon Collisions in Electron Storage Rings.
LPC-79-03 1260

PHOTONS

Two-Photon Laser-Induced Fluorescence in Oxygen and Nitrogen Atoms.
AD-A107 017/6 1148

Photon Correlation Spectroscopy of Bulk Siloxane Polymers.
AD-A107 153/9 1195

Fluctuation Properties of Multiplied-Poisson Light: Measurement of the Photon-Counting Distribution for Radioluminescence Radiation from Glass.
AD-A107 218/0 1256

Research on Metal Halide Laser Systems.
AD-A107 398/0 1255

Study of the Two-Photon Photorefractive Effect in Lithium Niobate,
AD-A107 493/9 1256

Bifurcations and Multistability in Two-photon Processes.
PB82-133901 1152

PHOTOPOLYMERIZATION

Photopolymerization. 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859182 1148

PHOTOVOLTAIC EFFECT

Sputtered Films for Wavelength-Selective Applications.
AD-A107 232/1 1200

PHOTOVOLTAIC POWER SUPPLIES

Intermediate Photovoltaic System Application Experiment Operational Performance: Executive Summary. Volume 1, for Newman Power Station, El Paso, TX.
DE81031934 1185

Possible Effects of Government and Industry Standards on Photovoltaic Products Liability.
DE81031936 1186

PHYSICAL CHEMISTRY

NRCC Software Catalog. Volume 1.
LBL-10811 1174

PHYSICAL EXERCISE

Effects of Curative Treatment Emphasizing Endurance Training on the Performance and Blood Pressure of Hypertensive and Normotensives.
N82-11771/4 1144

PHYSICAL PROPERTIES

Review of the Experimental and Analytical Methods for the Determination of the Pressure-Volume-Temperature Properties of Electrolytes.
AD-A107 208/1 1149

PHYSICIAN ASSISTANTS

Nurses: Emerging Roles. July, 1978-November, 1981 (Citations from the NTIS Data Base).
PB82-802620 1111

PHYSICIANS

Physicians and Financial Incentives,
PB82-133695 1132

Synthesis of Recent Research on Medical Career Decisions: A Comparative Study of Physicians from Two Decades. Executive Summary and Final Report.
PB82-133737 1110

Issues in Physician Reimbursement: Conference Proceedings,
PB82-135757 1132

PHYSIOLOGICAL EFFECTS

Participation of the Hypophyseal-Adrenal Cortex System in Thrombin Clearance During Immobilization Stress.
N82-11760/7 1144

PIEZOELECTRIC MATERIALS

Intrinsic Stress in Thin Films Deposited on Anisotropic Substrates and its Influence on the Natural Frequencies of Piezoelectric Resonators.
AD-A107 014/3 1170

PILE DRIVERS

Noise Control: Pile Driver Demonstration Project, Waterloo, Iowa.
AD-A107 239/6 1205

KEYWORD INDEX

PILE STRUCTURES
Field Study of Pile Group Action. Appendix A.
PB82-137639 1215
Field Study of Pile Group Action. Appendix B.
PB82-137647 1215

PILOTING
Aids to Navigation Principal Findings on the CAORF Experiment. The Performance of Visual Aids to Navigation as Evaluated by Simulation.
AD-A107 045/7 1236

PILOTS
Preparation and Design for a Training Effectiveness Evaluation of Device 2F64C for Replacement Pilot Training.
AD-A106 939/2 1106
Aids to Navigation Principal Findings on the CAORF Experiment. The Performance of Visual Aids to Navigation as Evaluated by Simulation.
AD-A107 045/7 1236
The Determinants of Career Decisions of Air Force Pilots.
AD-A107 265/1 1108

PINE TREES
Monoterpenes of Lodgepole Pine Phloem as Related to Mountain Pine Beetles.
PB82-107293 1081
New Record of Introduced Hosts for the Mountain Pine Beetle in California.
PB82-134438 1082
Preserving the Green Sale Value of Dying Ponderosa Pine with Lindane.
PB82-134446 1082
Field Evaluation of Phloem-Mobile Acephate for Suppression of Southern Pine Beetle.
PB82-134479 1082

PINUS
New Record of Introduced Hosts for the Mountain Pine Beetle in California.
PB82-134438 1082

PINUS CONTORTA
Monoterpenes of Lodgepole Pine Phloem as Related to Mountain Pine Beetles.
PB82-107293 1081

PINUS LAMBERTIANA
Preserving the Green Sale Value of Dying Ponderosa Pine with Lindane.
PB82-134446 1082

PINUS PONDEROSA
Preserving the Green Sale Value of Dying Ponderosa Pine with Lindane.
PB82-134446 1082

PINUS TAEDA
Field Evaluation of Phloem-Mobile Acephate for Suppression of Southern Pine Beetle.
PB82-134479 1082

PION MINUS-PROTON INTERACTIONS
Strange-Particle Cross Sections from Four-Prong pi exp - p Interactions at 16 GeV/C.
JINR-E-1-12345 1258
Xi exp 0 Hyperon in the pi exp - p Interactions at 16 GeV/C.
JINR-R-1-11654 1258

PION REACTIONS
Self-Consistent Theory of Hadron-Nucleus Scattering. Application to Pion Physics.
LA-UR-80-2496 1259

PIONS
Weak and Electromagnetic Characteristics of Pseudoscalar Mesons in the Nonlocal Quark Model.
JINR-R-4-12509 1259
Hadronic Cross Sections Study in E exp + E exp - Collisions from 1.350 GeV to 2.125 GeV.
LAL-78-32 1260

PIONS NEUTRAL
Xi exp 0 Hyperon in the pi exp - p Interactions at 16 GeV/C.
JINR-R-1-11654 1258

PIPELINE TRANSPORTATION
Cost Variance Analysis of Certification Cost Estimate for Alaska Segment of ANGTS.
PB82-134313 1269

PIPELINES
Goal: Better Standards for Pipeline Welds.
PB82-134008 1213
Protective Coatings for Pipelines. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-858564 1190

PIPES
Influence of Cyclic Load and Environmental Effects on Stress Corrosion Cracking of Sensitized Stainless Steel. Final Report.
DE81904216 1192

PIPES (TUBES)
Study of Foldable Elastic Tubes for Large Space Structure Applications, Phase 3.
N82-11493/5 1273

PISCATAQUA RIVER
Piscataqua and New Hampshire Coastal River Basins Overview.
PB82-107145 1160

PISTON ENGINES
Preliminary Study of Temperature Measurement Techniques for Stirling Engine Reciprocating Seals.
N82-11466/1 1271

PLANE WAVES
Electromagnetic Transmission through a Rectangular Aperture in a Perfectly Conducting Plane.
AD-A107 521/7 1264

PLANETARY ENVIRONMENTS
A Proposed New Policy for Planetary Protection.
N82-11095/8 1272

PLANETARY EVOLUTION
Workshop on Early Crustal Genesis: Implications from Earth.
N82-11691/4 1158
Study of the Time Evolution of the Lithosphere.
N82-11696/3 1157

PLANKTON
Development of the Coastal Zone Color Scanner for Nimbus 7. Volume 1: Mission Objectives and Instrument Description.
N82-11511/4 1228

PLANKTON BLOOMS
Red Tide: Taxonomy and Life Cycle. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859703 1122

PLANNING
Transportation Contingency Plans for Future Gas Shortages will not Meet Commuter Needs.
AD-A106 826/1 1179
Some Planning Theories (Algunos Enfoques de Planeacion).
PB82-135369 1092

PLANNING PROGRAMMING BUDGETING
Ohio's 1981 Home Energy Assistance Program.
AD-A106 872/5 1180
Update of Cost Information Contained in a Previous GAO Report on Specific Aspects of the Clinch River Breeder Reactor Project.
AD-A106 918/6 1246
Preliminary Analysis of Technical Risk and Cost Uncertainty in Selected DARPA Programs.
AD-A107 402/0 1090
Cooperative Extension Service's Mission and Federal Role Need Congressional Clarification.
AD-A107 482/2 1102

PLANT CELLS
Biotechnology in Agricultural Research (Biotechnologie in het Landbouwkundig Onderzoek).
PB82-140450 1134

PLANT STRESS
Soil Moisture Inferences from Thermal Infrared Measurements of Vegetation Temperatures.
N81-29500/8 1169
The Environmental Vegetation Index: A Tool Potentially Useful for Arid Land Management.
N81-29505/7 1081

PLANTS (BOTANY)
Convention on International Trade in Endangered Species of Wild Fauna and Flora; 1979 Annual Report for the United States of America.
PB82-128646 1098

PLASMA
Laser-Matter Interaction.
AECL-6343 1260

PLASMA CONTROL
Plasma Theory and Simulation.
AD-A107 467/3 1260

PLASMA DEVICES
Kink Instabilities in Long Ion Layers.
AD-A107 466/5 1239
Plasma Theory and Simulation.
AD-A107 467/3 1260

PLASMA DIAGNOSTICS
Oblique Propagation of Electron Thermal Modes Below the Electron Plasma Frequency Without Boundary Effects.
N82-11928/0 1261

PLASMA DRIFT
Theory of Drift Instabilities and the Associated Anomalous Transport.
N82-11924/9 1240

PLASMA-ELECTROMAGNETIC INTERACTION
An Energy Integral and Variational Principle for Plasma Kinetic Modes.
N82-11926/4 1261

PLASMA ETCHING
Plasma Etching Technology and Applications. 1970-1981 (Citations from the Searchable Physics Information Notices Data Base).
PB82-859208 1223

PLASMA HEATING
Boosting Up of Neutral Beam Heating Power by Slowly Rising Toroidal Field.
N82-11929/8 1240

PLASMA INSTABILITY
Kink Instabilities in Long Ion Layers.
AD-A107 466/5 1239

PLASMA OSCILLATIONS
An Energy Integral and Variational Principle for Plasma Kinetic Modes.
N82-11926/4 1261

PLASMA PHYSICS
Telecommunications in Cometary Environments.
N82-11340/8 1234

PLASMA RADIATION
Least Squares Autoregressive (Maximum Entropy) Spectral Estimation for Fourier Spectroscopy and Its Application to the Electron Cyclotron Emission from Plasma.
N82-11925/6 1261

PLASMA SPECTROSCOPY
Inductively Coupled Plasma-Atomic Emission Spectrometric Analysis of Environmental Samples Using Ultrasonic Nebulization.
PB82-118209 1229

PLASMAS (PHYSICS)
The Lower-Hybrid-Drift Instability in Non-Antiparallel Reversed Field Plasmas.
AD-A107 269/3 1084
Quasineutral Hybrid Simulation of Macroscopic Plasma.
AD-A107 468/1 1260
Plasma Solitons. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
PB82-859745 1261

PLASMODIUM BERGHEI
2-Acetylpyridine Thiosemicarbazones. 3. Selenium Analogs as Potential Antimalarial Agents.
AD-A106 958/2 1141

PLASMODIUM FALCIPARUM
Inhibition of in vitro Growth of Plasmodium falciparum by Immune Serum from Monkeys.
AD-A106 960/8 1122

PLASTIC CONCRETE
Improvement of Device (CMD) for Monitoring the Consolidation of Plastic Concrete.
PB82-132390 1219

PLASTIC DEFORMATION
Fields near a Rapidly Propagating Crack-Tip in an Elastic Perfectly-Plastic Material.
AD-A107 350/1 1195

PLASTICIZERS
Chemical Technology and Economics in Environmental Perspective. Task VI - A Survey of Plasticizers: Epoxies, Linear Polyesters, and Trimellitates.
PB82-136102 1147

PLASTICS
The Wear of Polymers Sliding on Polymeric Films Deposited on Rough Surfaces.
AD-A107 158/8 1195
Men's Apparel Industrywide Study: Fechheimer Bros. Co., Cincinnati, Ohio.
PB82-107269 1140

PLATES
High-Speed Laser Platemaking from Digital Data for the Defense Mapping Agency.
AD-A107 380/8 1156

PLATES (TECTONICS)
A Review of an Attempt to Create Shatter Cones with Magnetic Flyer Plate Technology.
N82-11492/7 1158

PLOTTING
Methods for Presentation and Display of Multivariate Data.
N82-11833/2 1198
Plotting Routines NOMEN and CLINE.
PB82-121872 1175

PLUTONIUM
Applications of DHDECMP Extraction Chromatography to Nuclear Analytical Chemistry.
DE81030134 1150
Selected Environmental Plutonium Research Reports of the NAEG.
NVO-192(V.1) 1246
Plutonium in the Gulf of Mexico.
ORO-3852-36 1246

PLUTONIUM 239
Experimental Criticality Specifications, Update Through 1979. Informal Report.
LA-7170-MS-Sup.) 1249

PLUTONIUM 239 TARGET
Comparison of the ENDF/B-V and SOKRATOR Evaluations of exp 235 U, exp 239 Pu, exp 240 Pu and exp 241 Pu at Low Neutron Energies.
DE81032037 1258

PLUTONIUM 240 TARGET
Comparison of the ENDF/B-V and SOKRATOR Evaluations of exp 235 U, exp 239 Pu, exp 240 Pu and exp 241 Pu at Low Neutron Energies.
DE81032037 1258

PLUTONIUM 241 TARGET
Comparison of the ENDF/B-V and SOKRATOR Evaluations of exp 235 U, exp 239 Pu, exp 240 Pu and exp 241 Pu at Low Neutron Energies.

DE81032037 1258

PLUTONIUM COMPOUNDS
Mound Facility Activities in Chemical and Physical Research: July-December 1979.
MLM-2727 1240

PLUTONIUM DIOXIDE
Simulation of the Chemical State of Irradiated Oxide Fuel; Influence of the Internal Corrosion on the Mechanical Properties of Zry-4 Tubing.
KFK-2785 1247

POLICIES
Analysis of Federal Funding for Electric Utility R&D Projects.
AD-A106 888/1 1088

Report of the President's Task Force on Aircraft Crew Complement.
AD-A106 889/9 1106

A Proposed New Policy for Planetary Protection.
N82-11095/8 1272

POLITICAL ALLIANCES
Saudi Arabia: The Flexibility of Islamic Fundamentalism.
AD-A106 930/1 1102

POLLUTANTS
Characterization of Pollutants at Holston Army Ammunition Plant.
AD-A107 340/2 1149

POLLUTION
Coal Combustion Waste Manual: Evaluating Impacts to Fish and Wildlife.
PB82-141359 1216

POLLUTION ABATEMENT
Control of Air Pollution from Aviation: The Emission Standard Setting Process.
AD-A107 435/0 1208

POLLUTION CONTROL
Handbook for Industrial Noise Control.
N82-11858/9 1252

POLLUTION MONITORING
Shuttle Applications in Tropospheric Air Quality Observations.
N82-11635/1 1209

Laser Induced Fluoroescence from Algae: Results of a Ship-Borne Field Test.
N82-11758/1 1121

POLYBUTADIENE
Estimation of the Homogenization Temperature of a 1.2 Polybutadiene/1.4 Polybutadiene Diblock Copolymer Using Rheological Testing Methods.
AD-A107 069/7 1194

POLYCARBONATES
Miscible Polymer Blends Based on Polycarbonate and a Copolyester.
AD-A107 389/9 1195

POLYCARBORANES
Polycarboranes. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802554 1195

POLYCHLORINATED BIPHENYLS
Determination of Polychlorinated Biphenyls in Waste and Lubricating Oils.
PB82-133950 1153

POLYCRYSTALLINE
Energy and Tangential Momentum Accommodation on Different Flashed Tungsten and Gas Covered Tungsten Surfaces.
AD-A107 495/4 1149

POLYETHYLENES
Calculation of Neutron and gamma Ray Energy Spectra for Fusion Reactor Shield Design: Comparison with Experiment.
ORNL/TM-7360 1240

POLYIMIDE RESINS
Novel Improved PMR Polyimides.
N82-11117/0 1190

POLYIMIDES
Novel Improved PMR Polyimides.
N82-11117/0 1190

POLYMER CONCRETES
Polymer Impregnated Concrete and Polymer Concrete Overlays. Volume I.
PB82-133661 1220

Polymer Concrete Patching. Volume II.
PB82-133679 1220

Polymer Concrete Patching. Volume III. User's Manual.
PB82-133687 1220

POLYMERIC FILMS
The Wear of Polymers Sliding on Polymeric Films Deposited on Rough Surfaces.
AD-A107 158/8 1195

POLYMERIZATION
Photopolymerization. 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859182 1148

POLYMERS
Electrostatic Binding of Electroactive and Non-Electroactive Anions in a Surface-Confined, Electroactive Polymer: Selectivity of Binding Measured by Auger Spectroscopy and Cyclic Voltammetry.
AD-A106 928/5 1148

Engineering Design Handbook. Discontinuous Fiberglass Reinforced Thermoplastics.
AD-A106 942/6 1194

Solitons in Polyacetylene: Effects of Dilute Doping on Optical Absorption Spectra.
AD-A106 964/0 1148

Photoconductivity in Polyacetylene.
AD-A106 965/7 1194

A Basic Computer Program to Calculate Moisture Content in Resins and Fibre Reinforced Resin Composites.
AD-A106 970/7 1194

Creation and Annihilation of Solitons, Radicals, and Ions in Polyacetylene as Related to the Mechanisms of Isomerization, Doping and Conduction.
AD-A107 122/4 1195

Battery Separators Based on Polyphenylquinoxaline Polymer Blends.
AD-A107 130/7 1195

Photon Correlation Spectroscopy of Bulk Siloxane Polymers.
AD-A107 153/9 1195

Depolarized Rayleigh Spectra of Siloxane Polymers.
AD-A107 161/2 1195

The Chemistry of Polyacetylene Doping.
AD-A107 165/3 1195

Preparation and Characterization of Neutral and Oxidized Polypyrrole Films.
AD-A107 166/1 1195

(13)C NMR of AsF5 Doped Polyacetylene.
AD-A107 167/9 1149

The Fracture of Thermosetting Resins after Exposure to Water.
AD-A107 237/0 1195

Soliton Formation and cis trans Isomerization in Polyacetylene.
AD-A107 274/3 1195

Fields near a Rapidly Propagating Crack-Tip in an Elastic Perfectly-Plastic Material.
AD-A107 350/1 1195

Miscible Polymer Blends Based on Polycarbonate and a Copolyester.
AD-A107 389/9 1195

Synthesis of Energetic Polymers.
AD-A107 498/8 1147

Survey of Matrix Materials for Solidified Radioactive High-Level Waste.
DE82000708 1244

NRCC Software Catalog. Volume 1.
LBL-10811 1174

Polymer Morphology. July, 1970-December, 1981 (Citations from the Engineering Index Data Base).
PB82-859752 1154

POLYMORPHONUCLEAR NEUTROPHILS
Kinetics of Neutrophil-Releasing Activity of Post-Leukapheresis Plasma.
AD-A107 541/5 1124

POLYNOMIALS
Computation of Abscissa of Stability by Repeated Use of the Routh Test.
PB82-134800 1199

POLYSTYRENE
Combustion Research. Chapter from the Energy and Environment Division Annual Report 1978.
LBL-9809 1209

PONTOON BRIDGES
Evergreen Point Bridge Maintenance Problems, 1980.
PB82-128489 1210

Evergreen Point Bridge Maintenance Problems, 1977.
PB82-128505 1211

POPULATION (STATISTICS)
Methodology for Generating Detailed Population Estimates and Projections for the State of Maine: Number 4.
HRP-0903730/0 1113

POROUS MATERIALS
Icing Tunnel Tests of a Composite Porous Leading Edge for Use with a Liquid Anti-Ice System.
N82-11052/9 1078

PORTABLE SHELTERS
Cold Regions Testing of an Air-Transportable Shelter.
AD-A107 131/5 1226

POSITION FINDING
Inertial Surveying Technology.
AD-A107 379/0 1157

The Effect of Ionospheric Variability on the Accuracy of High Frequency Position Location.
AD-A107 425/1 1237

POSTMISSION ANALYSIS (SPACECRAFT)
ATS-5 12 Year in Orbit Evaluation.
N82-11101/4 1272

POTASSIUM
Effect of Low Potassium Diet on Rat Exercise Hyperthermia and Heatstroke Mortality.
AD-A107 006/9 1144

POTASSIUM PHOSPHATES
Behavior of Alkali Metal-Acid Phosphates During Elevated Temperature Water Electrolysis.
DE82000243 1267

POTENTIAL FLOW
A Wake Source Model for Asymmetric Potential Flow past Bodies of Wedge Shape.
N82-11036/2 1254

Generation of Axi-Symmetric Body Shapes in Subsonic Flow by Means of Polynomial Distributions of Sources and Doublets Along the Axis of Symmetry.
N82-11038/8 1254

Calculations of Transonic Potential Flow over Cascades.
N82-11041/2 1270

POTHOLE ENDURANCE
Pothole Primer. A Public Administrator's Guide to Understanding and Managing the Pothole Problem.
AD-A107 294/1 1205

POULTRY
Poultry Production, Disposition, and Income: Final Estimates for 1976-79.
PB82-133430 1080

Poultry Meat: Microbiology. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859331 1138

POWDER METALLURGY
Trends in High Temperature Gas Turbine Materials.
N82-11182/4 1193

POWDER PATTERNS
Comparison of Profile and Integrated-Intensity Methods in Powder Refinement.
PB82-133935 1253

POWER MODULES (STS)
Concept for a Power System Controller for Large Space Electrical Power Systems.
N82-11109/7 1177

POWER SPECTRA
A New Algorithm for Two-Dimensional Maximum Entropy Power Spectrum Estimation.
AD-A107 123/2 1178

POWER TRANSMISSION LINES
Overhead Power Transmission. 1976-1981 (Citations from the Energy Data Base).
PB82-859513 1179

PREAMPLIFIERS
A 31-GHz Monolithic GaAs Mixer/Preamplifier Circuit for Receiver Applications.
AD-A107 062/2 1178

PRECIPITATION (METEOROLOGY)
Evaluation of Photogrammetric Flight under Icing Conditions on March 23, 1978.
N82-11725/0 1087

PREDICTIONS
Predicting Failure of Optical Glass Fibers.
AD-A107 245/3 1189

PREFABRICATION
Industrialized Housing. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802349 1227

PREFERENTIAL RUNWAY SYSTEMS
Airport Noise. 1964-October, 1981 (Citations from the NTIS Data Base).
PB82-802364 1217

PREPARATION
The United States Remains Unprepared for Oil Import Disruptions. Volume I. Summary: Includes Conclusions and Recommendations.
AD-A106 921/0 1180

PREPREGS
The Industrial Processing of Unidirectional Fiber Prepregs.
N82-11119/6 1191

PRESCRIBED BURNING
Oak Management in California.
PB82-134453 1082

PRESCRIPTION DRUGS
Approved Prescription Drug Products with Therapeutic Equivalence Evaluations.
PB82-129164 1141

PRESSURE
Ignition of Composite Propellants under Rapid Pressure Loading.
AD-A107 147/1 1271

PRESSURE DISTRIBUTION
A Comparison of Theoretical and Experimental Pressure Distributions for Two Advanced Fighter Wings.
N82-11054/5 1078

PRESSURE GAGES
Shock Tube Tests of Muzzle Blast Transducers.
AD-A107 319/6 1251

PRESSURE MEASUREMENT
Shock Tube Tests of Muzzle Blast Transducers.
AD-A107 319/6 1251

PRESSURE TRANSDUCERS
Shock Tube Tests of Muzzle Blast Transducers.
AD-A107 319/6 1251

PRESSURE VESSELS
LWR Pressure Vessel Irradiation Surveillance Dosimetry.
NUREG/CR-1241-V4 1246

PRESSURIZED WATER REACTORS
1/5-Scale Countercurrent Flow Data Presentation and Discussion.
NUREG/CR-2106 1248

PREVENTIVE DENTISTRY
Evaluation of the Effectiveness and Efficiency of Preventive Dentistry Programs: Assessment of the Relationship between Past Dental Experience and Dental Sick Call in the Field.
AD-A107 506/8 1124

Comparison of the Caries-Preventive Effects of Neutral Sodium Fluoride and Acidulated Phosphate Fluoride.
PB82-135203 1132

PREVENTIVE MEDICINE
Prevention of Low Back Injury in the Industrial Work Force: Symposium Held at Cincinnati, Ohio on November 9, 1972.
PB82-107251 1140

Preventive Medicine: Hazardous Materials Exposure and Public Health. 1976-1981 (Citations from the Energy Data Base).
PB82-859216 1135

PRICES
Fair Market Rents (FMRs) for Existing Dwellings: An Evaluation Through Hedonic Index Methods,
PB82-144486 1116

PRIMARY COOLANT CIRCUITS
Seminar on Countermeasures for Pipe Cracking in BWRs.
DE82900055 1247

PRIMARY HEALTH CARE
The Health Systems Agency Role in Building Primary Care Systems at the Local Level: A Recent Example,
HRP-0903737/5 1129

PRIME NUMBERS
Number Theory. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-859018 1199

PRINTERS (DATA PROCESSING)
High-Speed Rotary Printing Device for Air Traffic Control Applications: A Preliminary Evaluation.
AD-A107 325/3 1237

Computer Program Documentation User Information for the Rso-Tape Print Program (Rsoprnt).
N81-29509/9 1174

PRINTING
Dust-Free Printing. 1975-1981 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
PB82-858051 1230

PRIORITIES
Federal Water Resources Research: A Review of the Proposed Five-Year Program Plan.
PB82-135559 1214

PROBABILITY THEORY
Inference Procedure with Uncertainty for Problem Reduction Method,
PB82-131772 1198

PROBES
Investigation of Combustion Process Using Fiber Optics.
AD-A107 029/1 1264

PROBIT ANALYSIS
POLO2: A User's Guide to Multiple Probit or LOgit Analysis.
PB82-134487 1198

PROBLEM SOLVING
A Second-Order Accurate Procedure for Solving the Boundary Layer Equations Based on the Predictor-Corrector Form of the Crank-Nicolson Scheme.
N82-11826/6 1198

PROCESS CONTROL
Multivariable Control of a Milling Circuit at East Driefontein Gold Mine,
PB82-128729 1166

PROCESS DEVELOPMENT UNITS
Module Experimental Process System Development Unit (MEPSDU). Quarterly Report No. 3, June 1, 1981-August 31, 1981.
DE82000093 1186

PROCESS HEAT
Assessment of an Atmospheric Fluidized-Bed Coal-Combustion Gas-Turbine Cogeneration System for Industrial Application.
ORNL/TM-6626/V1 1187

PROCESS HEAT REACTORS
HTGR-GT Closed-Cycle Gas Turbine: A Plant Concept with Inherent Cogeneration (Power Plus Heat Production) Capability.
GA-A-15837 1242

PROCESSING
Densities of NaCl, MgCl2, Na2SO4, and MgSO4 Aqueous Solutions at 1 atm from 0 to 50 C and from 0.001 to 1.5 m.
AD-A107 207/3 1149

The Development of a High Average Power Glass Laser Source.
AD-A107 527/4 1255

PRODUCT DEVELOPMENT
Integrated Analysis of Engine.
N82-11491/9 1078

Solar Cell Development for the Power Extension Package.
N82-11551/0 1187

Rationale Statements for Voluntary Standards - Issues, Techniques, and Consequences.
PB82-135856 1093

PRODUCT INFORMATION
FDA Drug and Device Product Approvals.
PB82-923700 1142

PRODUCTION
Follow-up Report on Domestic Aluminum Resources: Dilemmas of Development.
AD-A106 901/2 1191

Process for Fragment Layup, Filler Application, and Outer Coating for PATRIOT GM Warhead M248.
AD-A107 536/5 1232

PRODUCTIVITY
Productivity Trends in the Construction Industry: A Comparative International Review,
PB82-144320 1216

PROFESSIONAL PERSONNEL
An Approach to Selecting Panels of Experts,
PB82-139569 1110

The Delphi Technique: Analysis of Responses to a Survey of Children's Mental Health Services Development,
PB82-139577 1110

An Approach to Identifying Objectives for Targeted Research Programs,
PB82-139585 1111

PROFESSIONAL STANDARDS REVIEW ORGANIZATIONS
Design of an Evaluation of PSRO Long-Term Care Review.
PB82-131616 1132

PROGRAM EVALUATION
Self-Evaluation for Rape-Responsive Organizations. Volume II: A Self-Evaluation Guide for Programs Serving Victims of Rape.
PB82-110214 1130

Self-Evaluation for Rape-Responsive Organizations. Volume III: A Self-Evaluation Guide for Rape-Responsive Community Education Programs.
PB82-110222 1131

Self-Evaluation for Rape-Responsive Organizations. Volume IV: A Self-Evaluation Guide for Rape Responsive Training Programs.
PB82-110230 1131

PROGRAM PLANNING
Anatomy and Assessment of Program Planning at the National Eye Institute,
PB82-107869 1091

PROGRAMMING ENVIRONMENTS
Programming Support Library (PSL). Users Manual.
AD-A107 249/5 1172

Programming Support Library (PSL). Technical Report.
AD-A107 250/3 1172

Programming Support Library (PSL). Operations Manual.
AD-A107 251/1 1172

Programming Support Library (PSL). Maintenance Manual. Volume I.
AD-A107 252/9 1172

Programming Support Library (PSL). Maintenance Manual. Volume II.
AD-A107 253/7 1172

The Impact of Multiprocessor Technology on High-Level Language Design.
AD-A107 533/2 1173

PROGRAMMING LANGUAGES
The Automatic Generation of Syntax Directed Editors.
AD-A107 078/8 1171

SYCOL: Informal Language Specification,
PB82-135658 1176

SYCOL: A High Level Language for Applications in Real Time Control Systems,
PB82-135666 1176

The Use of Applicative Programming in Data Processing.
PB82-136219 1176

Evaluation Criteria for a CODASYL Query Language.
PB82-136748 1176

Capabilities for a CODASYL Query Language.
PB82-136755 1176

A Survey of CODASYL Query Languages.
PB82-136763 1176

PROJECT SETI
The Telecommunications and Data Acquisition Report.
N82-11279/8 1234

PROJECTILE CONFIGURATIONS
A General Curvilinear Grid Generation Program for Projectile Configurations.
AD-A107 334/5 1250

PROJECTILES
A General Curvilinear Grid Generation Program for Projectile Configurations.
AD-A107 334/5 1250

PROMOTION (ADVANCEMENT)
Performance as a Factor in Enlisted Promotions.
AD-A107 298/2 1108

PROMPT NEUTRONS
Shape of Prompt Neutron Spectrum from exp 252 Cf Spontaneous Fission.
NIIAR-1(360) 1260

PROPAGANDA
Soviet News and Propaganda Highlights from 'Red Star' (The Official Newspaper of the Soviet Defense Establishment) for the Period 1-31 July 1981.
AD-A107 483/0 1102

Soviet News and Propaganda Analysis from 'Red Star' (The Official Newspaper of the Soviet Defense Establishment) for the Period 1-31 August 1981. Volume 1. Number 8, 1981.
AD-A107 484/8 1102

PROPERTY VALUES
Corps of Engineers' Acquisition of Fish Hatchery Proves Costly.
AD-A106 828/7 1079

PROPULSION SYSTEM PERFORMANCE
JT8D High Pressure Compressor Performance Improvement.
N82-11467/9 1270

PROSTAGLANDIN
Effects of Intravenous 16,16 Dimethyl Prostaglandin E2 on Bile Salt Induced Injury to Gastric Mucosa in Canine Heidenhain Pouches.
AD-A106 950/9 1141

PROSTHETIC DEVICES
Fabrication and Wear Test of a Continuous Fiber/Particulate Composite Total Surface Hip Replacement.
N82-11211/1 1140

PROTECTIVE CLOTHING
Protection Factors of the Airstream Helmet.
PB82-135575 1143

PROTECTIVE COATINGS
Silicon Carbide as an Oxidation-Resistant High-Temperature Material. 1: Oxidation and Heat Corrosion Behavior.
N82-11120/4 1189

Fabrication and Wear Test of a Continuous Fiber/Particulate Composite Total Surface Hip Replacement.
N82-11211/1 1140

Protective Coatings for Pipelines. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-858564 1190

Corrosion Protection of Metals and Metal Alloys. 1976-1981 (Citations from the Energy Data Base).
PB82-858966 1193

Zinc and Zinc Alloys as Protective Coatings. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859935 1190

PROTEIN SYNTHESIS
Cyclic Nucleotides in Tissues During Long-Term Hypokinesia.
N82-11757/3 1144

PROTEINS
The Effects of Diet Calcium, Protein and Acidity on Calcium Retention in the Rat, Particularly as Related to the Inner and Outer Surfaces of Tubular Bone: A Possibie Model for the Treatment or Prevention of Osteoporosis.
AD-A107 200/8 1123

Heterogeneity and Expression of the Zein Storage Protein Gene Family of Maize.
DE81030735 1120

Regulation of Nucleic Acid and Protein Synthesis: A Background Study Related to the Biological Effects of Radiation. Final Report on Research Activities.
DE82000396 1120

NRCC Software Catalog. Volume 1.
LBL-10811 1174

Selected Aspects of Cancer-Related Proteins, Carbohydrate, Lipid, and Other Biochemistry.
PB81-929905 1120

PROTON-ANTIPROTON INTERACTIONS
Comparison of Charged Particle Multiplicity Distributions in p Tilde p and Pp Interactions and Verification of the Dual Unitarization Scheme.
JINR-E-1-12306 1258

PROTON BEAMS
Polarimeter for Protons Between 300 and 800 MeV.
LA-UR-80-1943 1241

PROTON-NEUTRON INTERACTIONS
Measurement of K/sub NN/, K/sub SS/, K/sub SL/, and K/sub LL/ in Polarized Np Implies Polarized Pn at 800 MeV in the CEX Region.
LA-UR-80-1976 1259

PROTON-PROTON INTERACTIONS
Comparison of Charged Particle Multiplicity Distributions in p Tilde p and Pp Interactions and Verification of the Dual Unitarization Scheme.
JINR-E-1-12306 1258

Role of Valons in Low-p/sub T/ Physics.
LA-UR-80-2235 1259

PROTON REACTIONS
Hyperfragment Production in Proton-Nucleus Interactions at 70 and 250 GeV.
JINR-R-1-12315 1258

Exp 3 H(p,N) exp 3 He Differential Cross Sections Below 5 MeV and the n- exp 3 He Cross Sections.
LA-8215-MS 1259

PROTONS
Proton Upsets in LSI Memories in Space.
AD-A107 331/1 1173

PSL (PROGRAMMING SUPPORT LIBRARY)
Programming Support Library (PSL). Users Manual.
AD-A107 249/5 1172

Programming Support Library (PSL). Technical Report.
AD-A107 250/3 1172

Programming Support Library (PSL). Operations Manual.
AD-A107 251/1 1172

Programming Support Library (PSL). Maintenance Manual. Volume I.
AD-A107 252/9 1172

Programming Support Library (PSL). Maintenance Manual. Volume II.
AD-A107 253/7 1172

PSYCHIATRY
The Health Opinion Survey: Predicting Illness in Military Trainees.
AD-A106 853/5 1122

PSYCHONEUROPHARMACOLOGY
Psychotropic Drug Research. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802604 1142

PUBLIC ADMINISTRATION
Analysis of HUD's May 4, 1981 Response Concerning Its Efforts to Alleviate Housing Abandonment.
AD-A106 832/9 1203

SBA's 7(j) Management Assistance Program: Changes Needed to Improve Efficiency and Effectiveness.
AD-A106 839/4 1088

Veterans Administration Education Loan Program Should be Terminated: Legislative Action Taken.
AD-A106 845/1 1105

Follow-Up Review to Determine the Extent to Which the Department of Health and Human Services has Implemented the Recommendations in Our Report: 'Increased Federal Efforts Needed to Better Identify, Treat, and Prevent Child Abuse and Neglect'.
AD-A106 849/3 1113

Concerns about HHS' Ability to Effectively Implement Incentive Funding for State Information Systems in the Aid to Families with Dependent Children Program.
AD-A106 871/7 1088

Limits on Receipt of Multiple Disability Benefits Could Save Millions.
AD-A106 874/1 1106

Management of the Department of State Office of Passport Services Needs to be Improved.
AD-A106 880/8 1088

Examination of the Effectiveness of Statutory Offices of Inspector General.
AD-A107 187/7 1089

Terminating the Audit of the National Flood Insurance Program's Fiscal 1980 Financial Statements.
AD-A107 188/5 1089

Allegations that a Political Appointee at the Environmental Protection Agency was Exercising Control over the Office of the Inspector General.
AD-A107 190/1 1108

Issues Related to the Longshoremen's and Harbor Workers' Compensation Act.
AD-A107 193/5 1108

Status of Strategic Petroleum Reserve Activities--October 1980.
AD-A107 196/8 1266

Information on Peanut Allotment Owners that Lease and Rent Away Rather Than Plant Their Peanut Allotments/Quotas.
AD-A107 377/4 1079

Consortium for Public Administration Field Services: The First Two Years.
PB82-144700 1093

PUBLIC BUILDINGS
Energy Use in Minnesota Public Buildings: Data Management and Analysis.
ORNL/CON-53 1182

PUBLIC HEALTH
Coal and Nuclear Wastes--Both Potential Contributors to Environmental and Health Problems.
AD-A106 884/0 1135

Assessment of the Public Health Sector in Honduras, 1975-1985.
PB82-131095 1131

National Conference for Institutions Preparing Health Educators, February 5-7, 1981, Birmingham, Alabama: Proceedings.
PB82-134263 1110

PUBLIC HOUSING
Inquiry into the Status of a Proposal to Construct 16 Single-Family Detached Homes for the Cuyahoga Metropolitan Housing Authority in Cleveland, Ohio.
AD-A106 891/5 1113

HUD's Oversight of Procurement by Public Housing Authorities Needs Strengthening.
AD-A106 895/6 1089

PUBLIC OFFICIALS
Directory of Soviet Officials: Republic Organizations.
PB81-928110 1095

PUBLIC OPINION
Inferred Referendum and Its Comparison with Borda Voting.
DE82000170 1103

A Survey of Citizen Views and Concerns About Urban Life.
PB82-141250 1115

PUBLIC RELATIONS
Let's Make a Deal or On the Way to Public - Private Partnerships,
PB82-144536 1093

PUBLIC TRANSPORTATION
Finance Issues: County Highways and Public Transit,
PB82-128828 1091

PUBLIC UTILITIES
Ohio's 1981 Home Energy Assistance Program.
AD-A106 872/5 1180

Analysis of Federal Funding for Electric Utility R&D Projects.
AD-A106 888/1 1088

Burdensome and Unnecessary Reporting Requirements of the Public Utility Regulatory Policies Act Need to be Changed.
AD-A106 904/6 1180

Greater Commitment Needed to Solve Continuing Problems at Three Mile Island.
AD-A106 915/2 1242

Integration of Solar Energy into Utility-System Planning and Strategies: 1980-2000.
DE81028923 1181

Utility Rate Guide for SOLCOST Data Bank Cities.
DE82000468 1268

Rate Guide for Residential No. 2 Heating Oil and Coal for SOLCOST Data Bank Cities.
DE82000483 1268

Utility Solar Finance: Economic and Institutional Analysis.
LBL-9959 1098

Cogeneration Feasibility Study in the Gulf States Utilities Service Area.
ORNL/SUB-7317/1 1187

PUDP (PICKUP AND DELIVERY PROBLEM)
The Single and Multiple Vehicle Pickup and Delivery Problem: Exact and Heuristic Algorithms.
AD-A107 202/4 1199

PUGET SOUND
Evaluation of Existing Marine Intertidal and Shallow Subtidal Biologic Data,
PB82-134065 1155

PULMONARY ACADEMIC AWARD PROGRAM
An Evaluation of the National Heart, Lung and Blood Institute's Pulmonary Academic Award Program.
PB82-141326 1135

PULSE CODE MODULATION
Differential PCM Systems,
PB82-132804 1178

PULSE COMPRESSION
Linear Frequency Modulation Derived Polyphase Pulse-Compression Codes and an Efficient Digital Implementation.
AD-A107 268/5 1238

PULSE GENERATORS
Active Lamp Pulse Driver Circuit.
PAT-APPL-6-276 748 1179

PULSED LASERS
Device Development Program for Efficient Excitation of a Blue-Green Laser.
AD-A107 073/9 1255

Development of MBE Grown Pb-Salt Semiconductor Lasers for the 8.0 to 15.0 Micrometer Spectral Region.
N82-11453/9 1255

Active Lamp Pulse Driver Circuit.
PAT-APPL-6-276 748 1179

PUMPING
Evaluation of Tests for Determining the Pumpability of Concrete Mixtures.
AD-A107 524/1 1218

PURCHASING
Market Segmentation. 1974-1981 (Citations from the Management Contents Data Base).
PB82-859042 1102

PUROX PYROLYSIS PROCESS
Purox Pyrolysis Process. 1976-1981 (Citations from the Energy Data Base).
PB82-859521 1269

PWR TYPE REACTORS
SPH Homogeneization Method.
CEA-CONF-4492 1249

TRAC Posttest Calculations of Semiscale Test S-06-3.
LA-UR-80-716 1247

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LA-8403-PR 1247

Fuel Utilization Improvements in a Once-Through PWR Fuel Cycle. Final Report on Task 6.
ORNL/SUB-7494/3 1248

PYRIDINES
Determination of N-Methyl Pyridinium-2-Aldoxime Chloride and Its Hydrolytic By-Products by Ion-Pair High-Performance Liquid Chromatography.
AD-A106 962/4 1141

PYROHELIOMETERS
Low-Cost Solar Array Project: Four Absolute Cavity Radiometer (Pyrheliometer) Intercomparisons at New River, Arizona: Radiometer Standards.
N82-11435/6 1228

PYROLYSIS
Purox Pyrolysis Process. 1976-1981 (Citations from the Energy Data Base).
PB82-859521 1269

PYROTECHNIC DEVICES
Aluminum Particle Surface Studies in Al/Cu sub 2 O by Electron Spectroscopy for Chemical Analysis and Auger Electron Spectroscopy.
MLM-2664 1250

PYRROLES
Preparation and Characterization of Neutral and Oxidized Polypyrrole Films.
AD-A107 166/1 1195

QUALITY ASSURANCE
Peer Review,
PB82-135237 1132

QUALITY CONTROL
Application of the Method of Inequalities to the Multivariable Control of Binary Distillation Columns,
PB82-134792 1147

QUALITY OF LIFE
Summary and Recommendations: Conference on Pacific and Asian American Families and HEW-Related Issues,
PB82-107533 1113

Quality of Life in the Urban Environment. 1978-November, 1981 (Citations from the NTIS Data Base).
PB82-802539 1120

QUANTITATIVE ANALYSIS
Applications of the Microscan 9 Microanalyser.
AD-A106 969/9 1148

Determination of Sodium Gluconate in Corrosion-Removing Compounds.
AD-A107 244/6 1149

Corrosion Mechanism of Cu-9.4 Ni-1.7 Fe Alloy in 3.4 WT.% NaCl Solution with and without Sulfide Contamination.
AD-A107 393/1 1149

Advances in Sample Introduction for Elemental Analysis.
AD-A107 514/2 1150

Structure Study of Oxygen-Adsorbed Ni(111) Surface by High Energy Ion Scattering.
AD-A107 528/2 1150

QUANTUM CHEMISTRY
Quantum-Mechanical Studies on Chemical Reactivity and Ballistic Chemistry. VII. Semiempirical Molecular Orbital Calculations and Experimental Studies on Relative Chemical Reactivities of Isomeric Tetrazole Derivatives, and their Relationship to the Explosive Properties of some Tetrazole Derivatives.
AD-A107 288/3 1250

QUANTUM FIELD THEORY
Investigation of the Problem of Massive Particle Capture by Quantum Scalar Field. Determination of the Effective Mass of the System.
JINR-R-2-12470 1259

QUARK MODEL
Weak and Electromagnetic Characteristics of Pseudoscalar Mesons in the Nonlocal Quark Model.
JINR-R-4-12509 1259

QUARTZ RESONATORS
Intrinsic Stress in Thin Films Deposited on Anisotropic Substrates and its Influence on the Natural Frequencies of Piezoelectric Resonators.
AD-A107 014/3 1170

QUENCHING (COOLING)
Rapid Quenching of Metals. 1971-1981 (Citations from the Engineering Index Data Base).
PB82-859356 1223

QUERCUS
Oak Management in California.
PB82-134453 1082

QUERY LANGUAGES
Evaluation Criteria for a CODASYL Query Language.
PB82-136748 1176

Capabilities for a CODASYL Query Language.
PB82-136755 1176

A Survey of CODASYL Query Languages.
PB82-136763 1176

RACE RELATIONS
The Army Racial Awareness Program: A Case Study of Program Impact on Personal Values.

AD-A107 535/7 1113

RADAR ANTENNAS
Space-Based Radar Array System Simulation and Validation.
AD-A106 996/2 1238

RADAR DATA
SAR Processing on the MPP.
N82-11801/9 1174

RADAR EQUIPMENT
Chatanika Radar Measurements during the Auroral E Program.
AD-A107 117/4 1083

RADAR MAPS
Radar Mapping, Archaeology, and Ancient Land Use in the Maya Lowlands.
N82-11514/8 1104

RADAR NAVIGATION
TRACALS Evaluation Report. Solid State Instrument Landing System AN/GRN-29(V) Initial Evaluation Report, Columbus AFB, Mississippi, 7-20 July 1981.
AD-A107 397/2 1237

RADAR PULSES
Linear Frequency Modulation Derived Polyphase Pulse-Compression Codes and an Efficient Digital Implementation.
AD-A107 268/5 1238

RADAR REFLECTIONS
Atmospheric Fluctuations Which Lead to Trackable Radar Signals in the Marine Boundary Layer.
AD-A107 523/3 1238

RADAR SIGNALS
Active RF Seeker Analysis for Land Combat Seekers.
AD-A106 947/5 1238

Signal Analysis Van Hardware Operation General Description. Volume 1.
AD-A106 948/3 1238

RADAR TARGETS
Synthetic Aperture Radar Target Simulator.
PAT-APPL-6-284 287 1238

RADAR TRACKING
Active RF Seeker Analysis for Land Combat Seekers.
AD-A106 947/5 1238

TRACALS Evaluation Report. Airport Surveillance Radar AN/GPN-12. Special Evaluation Report. Salt lake City International Airport and Wendover Auxiliary Airfield, Utah, 3 and 6-15 June 1981.
AD-A107 234/7 1237

RADAR TRANSMITTERS
Continental United States Over-The-Horizon-Backscatter (OTH-B) Radar System. Supplement.
AD-A106 870/9 1237

A high-Frequency Broadband Transmitter for Monostatic Systems.
AD-A107 088/7 1238

RADIANT COOLING
Radiative Cooler.
PAT-APPL-6-284 289 1201

RADIATION ABSORPTION
Theoretical Investigation of Absorptive Processes.
AD-A107 278/4 1253

RADIATION CHEMISTRY
Radiation Laboratory, University of Notre Dame. Quarterly Report, April 1, 1981-June 30, 1981.
DE81030942 1155

RADIATION DAMAGE
Evaluation of the Effects of Solar Radiation on Glasses.
N82-11207/9 1256

Solar Cell Development for the Power Extension Package.
N82-11551/0 1187

RADIATION DISTRIBUTION
Radiation Balances and the Solar Constant.
N82-12016/3 1085

RADIATION DOSAGE
The Graphite Calorimeter as a Standard of Absorbed Dose for Cobalt-60 Gamma Radiation,
PB82-140617 1241

RADIATION EFFECTS
Computer-Based Operant Behavioral System for Microwave Bioeffects Research.
AD-A107 021/8 1143

Microwave Irradiation and Instrumental Behavior in Rats: Unitized Irradiation and Behavioral Evaluation Facility.
AD-A107 023/4 1143

Radiation Damage Processes in Silicon,
AD-A107 170/3 1252

Worst-Case Prediction of Single-Particle-Induced Permanent Failures in Microelectronics.
AD-A107 309/7 1171

Radiation Testing of Composite Materials, in Situ Versus Ex Situ Effects.
N82-11116/2 1190

Baseline Study of Effects of Ionizing Radiation on the Chromosomes of the Marine Worm, 'Neanthes arenaceodentata'.
PB82-131517 1143

Effects of Hyperthermia and Radiation. 1978-1981 (Citations from the Energy Data Base).
PB82-859968 1135

RADIATION HARDENING
EMP/EMI Hardening of Electrical Conduit Systems.
AD-A107 133/1 1171

RADIATION HAZARDS
CRRIS: A Computerized Radiological Risk-Investigation System.
DE82000136 1143

RADIATION MEASUREMENT
Radiation Balances and the Solar Constant.
N82-12016/3 1085

A Review and Interpretation of Recent Cosmic Ray Beryllium Isotope Measurements.
N82-12020/5 1083

RADIATION PROTECTION
Proceedings of a Workshop on the Protection of Personnel against Radiofrequency Electromagnetic Radiation Held at the Royal Air Force Establishment, Farnborough, United Kingdom, 6-8 April 1981.
AD-A107 357/6 1143

Proposed New Handbook for the Federal Emergency Management Agency: Radiation Safety in Shelters.
DE82000441 1230

RADIATION TOLERANCE
Processing of Silicon Solar Cells by Ion Implantation and Laser Annealing.
N82-11546/0 1186

RADIATIVE HEAT TRANSFER
Radiative Cooler.
PAT-APPL-6-284 289 1201

RADIATIVE TRANSFER
Efficient Radiative Transfer Computations in the Atmosphere.
AD-A107 289/1 1084

A Model Describing the Microwave Emission from a Multi-Layer Snowpack at 37 Ghz.
N82-11510/6 1169

An Evaluation of the Spatial Resolution of Soil Moisture Information.
N82-11513/0 1170

Theoretical Studies of Chromospheres and Winds in Cool Stars.
N82-12004/9 1082

Radiative Transfer in Cometary Dust Atmospheres: Critique of Recent Developments.
N82-12015/5 1083

RADIO ASTRONOMY
The Telecommunications and Data Acquisition Report.
N82-11279/8 1234

RADIO EQUIPMENT
Standard Engineering Installation Package. Air Traffic Radio Channel Control Equipment Change 1.
AD-A107 150/5 1236

Application of Digital Troposcatter to the DCS.
AD-A107 303/0 1234

RADIO LINKS
Application of Digital Troposcatter to the DCS.
AD-A107 303/0 1234

RADIO NAVIGATION
Simulator Evaluation of Electronic Radio Aids to Navigation Displays, the RA-1 Experiment.
AD-A106 941/8 1236

TRACALS Evaluation Report. VOR Special Evaluation Report, Williams AFB, Arizona, 22-27 July 1981.
AD-A107 396/4 1237

RADIO OPERATORS
Airborne Communication Systems Career Ladder, AFSC 294X0.
AD-A107 472/3 1109

RADIO TRANSMISSION
Propagation Study for a Tropospheric Transhorizon Radar.
AD-A107 039/0 1264

Effect of Hail, Snow, and Melting Hydrometeors on Millimeter Radio Waves.
AD-A107 429/3 1264

RADIO WAVES
The Effect of Ionospheric Variability on the Accuracy of High Frequency Position Location.
AD-A107 425/1 1237

RADIOACTIVE EFFLUENTS
Radioactive Materials Released from Nuclear Power Plants.
NUREG/CR-2227 1246

RADIOACTIVE MATERIALS
Evaluation of Proposed Methods of Radioactive Material Container Tie-down Design for Truck Transport.
DE81024032 1242

In-Process Inventory Estimation for Pulsed Columns and Mixer-Settlers.
LA-UR-80-741 1248

Dynamic Analysis to Establish Normal Shock and Vibration of Radioactive Material Shipping Packages.
NUREG/CR-2146-V1 1242

Transportation of Radioactive Material in South Carolina.
NUREG/CR-2195 1243

RADIOACTIVE WASTE DISPOSAL
Draft Environmental Impact Statement: Defense Waste Processing Facility, Savannah River Plant, Aiken, SC.
DE81030992 1243

Proceedings of the US Department of Energy Environmental Control Symposium. Volume 2. Nuclear Energy and Transportation.
DOE/EV-0046(V.2) 1244

Environmental and Other Evaluations of Alternatives for Long-Term Management of Buried INEL Transuranic Waste.
IDO-10085 1244

Fission Product Release. Progress Report, January 1-March 31, 1980.
LA-8389-PR 1249

Thermomechanical Modeling and Data Analysis for Heating Experiments at Stripa, Sweden.
LBL-10193(Rev.) 1245

State of the ART Review of Alternatives to Shallow Land Burial of Low Level Radioactive Waste.
ORNL/SUB-79/13837/1 1245

The Dutch Geologic Radioactive Waste Disposal Project.
PB82-138397 1245

Marine Disposal of Radioactive Wastes. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859307 1245

RADIOACTIVE WASTE FACILITIES
Draft Environmental Impact Statement: Defense Waste Processing Facility, Savannah River Plant, Aiken, SC.
DE81030992 1243

Socioeconomic Assessment of Defense Waste Processing Facility Impacts in the Savannah River Plant Region.
DE82000522 1244

RADIOACTIVE WASTE MANAGEMENT
Nuclear Waste Management Technology Development Activities. Progress Report, January-December 1978.
LA-7921-PR 1244

Public Information on Radioactive Waste: A Study of an Emerging Issue.
ORNL/OIAPA-13 1245

RADIOACTIVE WASTE PROCESSING
Draft Environmental Impact Statement: Defense Waste Processing Facility, Savannah River Plant, Aiken, SC.
DE81030992 1243

Preliminary Technical Data Summary for the Defense Waste Processing Facility, Stage 1.
DE82000035 1243

Socioeconomic Assessment of Defense Waste Processing Facility Impacts in the Savannah River Plant Region.
DE82000522 1244

Survey of Matrix Materials for Solidified Radioactive High-Level Waste.
DE82000708 1244

Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000817 1244

RADIOACTIVE WASTE STORAGE
In-Situ High-Resolution gamma-Spectrometric Survey of Burial Ground-Monitoring Wells.
DE81030827 1245

Disruption Scenarios for a Nuclear-Waste Repository on the Nevada Test Site.
DE81030844 1243

Durability of Simulated Supercalcine Ceramics at Geologic Storage Conditions.
NUREG/CR-2418 1245

RADIOACTIVE WASTES
Leaching of Nuclear-Waste Forms.
DE81030490 1243

Systems Studies of Waste Transportation.
DE81030840 1243

Development of Analytical Tools for the Punch Investigation of the Transuranic Package Transporter (TRUPACT).
DE82000820 1242

Analysis of Space Systems Study for the Space Disposal of Nuclear Waste Study Report. Volume 2: Technical Report.
N82-11889/4 1245

Durability of Simulated Supercalcine Ceramics at Geologic Storage Conditions.
NUREG/CR-2418 1245

Zeolites in Radioactive Applications. 1976-1981 (Citations from the Energy Data Base).
PB82-859422 1245

RADIOACTIVITY PROSPECTING
Aerial Radiometric and Magnetic Survey: Seguin National Topographic Map, Texas Gulf Coast.
GJBX-37(79)(V.1) 1163

Aerial Radiometric and Magnetic Survey: Seguin National Topographic Map, Texas Gulf Coast.
GJBX-37(79)(V.2) 1163

NURE Aerial gamma-Ray and Magnetic Reconnaissance Survey: Big Bend Area, MARFA MH 13-5, Fort Stockton MH 13-8, Presidio MH 13-8, and Emory Peak MH 13-9 Quadrangles.

GJBX-88(79)(V.2)MARFA 1165

RADIOBIOLOGY
PLUMBBOB Series, 1957.
AD-A107 317/0 1241
Radioecology. 1976-1981 (Citations from the Energy Data Base).
PB82-858895 1137

RADIOECOLOGY
Radioecology. 1976-1981 (Citations from the Energy Data Base).
PB82-858895 1137

RADIOFREQUENCY
Proceedings of a Workshop on the Protection of Personnel against Radiofrequency Electromagnetic Radiation Held at the Royal Air Force Establishment, Farnborough, United Kingdom, 6-8 April 1981.
AD-A107 357/6 1143

RADIOGRAPHY
Predictability of Dental Emergencies by Panography.
AD-A107 272/7 1123
Teleradiology.
AD-A107 431/9 1123
Standard Specification for Apparatus for gamma Radiography.
N82-11433/1 1228
Preventive Medicine: Hazardous Materials Exposure and Public Health. 1976-1981 (Citations from the Energy Data Base).
PB82-859216 1135

RADIOIMMUNOASSAY
International Symposium on Nuclear Techniques in the Study and Control of Parasitic Diseases of Man and Animals.
AD-A107 302/2 1123
Studies on the Rapid Detection of Dengue Virus Antigen by Immunofluorescence and Radioimmunoassay,
PB82-136052 1133

RADIOISOTOPES
Uranium and Thorium Series Nuclides in River Sediments and River Water.
ORO-3852-37 1246
Uranium and Thorium Series Isotopes in Nearshore Marine Sediments.
ORO-3852-38 1246

RADIOLOGY
Teleradiology.
AD-A107 431/9 1123

RADIOLYSIS
Evaluation of Gamma Radiation for Destruction of Pentachlorophenol in Aqueous Solution and on Activated Carbon.
AD-A106 943/4 1154

RADIOMETERS
Low-Cost Solar Array Project: Four Absolute Cavity Radiometer (Pyrheliometer) Intercomparisons at New River, Arizona: Radiometer Standards.
N82-11435/6 1228

RADIOMETRIC RESOLUTION
Antenna Pattern Modification for Single Reflector Antennas.
N82-11338/2 1264

RADIOMETRIC SURVEYS
Near-Surface Moisture and Biomass Influences on the Reliability of Aerial Radiometric Surveys as a Measure of Natural Radioelement Concentrations.
GJBX-136(80) 1162

RADOMES
Final Electromagnetic Test Report for the M10-76-8000 Radome with XP Plates.
AD-A107 404/6 1238

RADON
Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000817 1244
Operating Instructions for LBL Radon Measurement Facilities.
LBL-11097 1241

RAFT RIVER VALLEY
Case Study Data Base Companion Report 3 to Simulation of Geothermal Subsidence (LBL-10571).
LBL-10839 1166

RAIL TRANSPORTATION
Identification of Wheelset/Rail Creep Coefficients from Dynamic Response Data Using the Maximum Likelihood Parameter Identification Technique.
AD-A107 447/5 1221

RAILROAD ACCIDENTS
Railroad Accident Report: Brief Format Number 5, 1979.
PB82-128091 1210
Railroad Accident Report: Brief Format Issue Number 1, 1980.
PB82-128109 1210

RAILROAD CARS
Railroad Yard Simulation Model: Description and Computer Program Users' Manual.
PB82-138686 1222

RAILROAD RETIREMENT PROGRAM
Delays in Receiving and Investing Taxes are Reducing Railroad Retirement Program Interest Income.
AD-A106 861/8 1105

RAILROADS
Conrail Needs to Further Improve Inventory Control and Management.
AD-A106 837/8 1088
Railroad Accident Report: Brief Format Number 5, 1979.
PB82-128091 1210
Railroad Accident Report: Brief Format Issue Number 1, 1980.
PB82-128109 1210

RAIN
An Evaluation of the Spatial Resolution of Soil Moisture Information.
N82-11513/0 1170
Some Analysis on the Diurnal Variation of Rainfall over the Atlantic Ocean.
N82-11724/3 1087

RAINDROPS
A Computational Study of the Modification of Raindrop Size Distributions in Subcloud Downdrafts.
AD-A107 262/8 1084

RAMAN SPECTRA
Model Analysis of the Raman Spectrum from Fused Silica Optical Fibers.
AD-A106 938/4 1148

RAMJET ENGINES
Modeling Solid-Fuel Ramjet Combustion Including Radiation Heat Transfer to the Fuel Surface.
AD-A107 441/8 1270

RAMJET INLETS
Performance of an Oswatisch Inlet with Hemispherical Centerbody at Zero Angle of Attack.
AD-A107 439/2 1270

RANDOM VARIABLES
Final Scientific Report.
AD-A106 981/4 1196
Weak Compactness of Solution Measures Associated with Random Equations.
AD-A107 144/8 1197

RANGE FINDING
Source Ranging by a Single Array in a Multipath Ocean.
AD-A106 988/9 1232
Modification of Laser Rangefinder MX-9838( )/GVS-5 Into a Visioceilometer Optical Unit.
AD-A107 099/4 1227

RANK ORDER STATISTICS
Rank Correlation Coefficients as Optimality Measures for Ordinal Cluster Methods.
AD-A107 109/1 1196

RAPE
Self-Evaluation for Rape-Responsive Organizations. Volume II: A Self-Evaluation Guide for Programs Serving Victims of Rape.
PB82-110214 1130
Self-Evaluation for Rape-Responsive Organizations. Volume III: A Self-Evaluation Guide for Rape-Responsive Community Education Programs.
PB82-110222 1131
Self-Evaluation for Rape-Responsive Organizations. Volume IV: A Self-Evaluation Guide for Rape Responsive Training Programs.
PB82-110230 1131
Rape Reporting: Causes and Consequences,
PB82-133380 1114
Evaluation of a New Community Rape Treatment Center,
PB82-133398 1132
Perception of Rape: Influence on Causal Attributions,
PB82-133778 1112
Rape Response: A Research Demonstration Project,
PB82-134511 1132
The Prevalence of Rape and Sexual Assault.
PB82-134537 1096

RAPID TRANSIT RAILWAYS
Techniques for Analyzing the Performance of Rural Transit Systems. Volume I.
PB82-106436 1221
Investigation of Design Standards for Urban Rail Transit Elevated Structures.
PB82-130857 1221
Non-Contacting Suspension and Propulsion Systems for Transportation Applications,
PB82-135591 1221

RARE EARTH COMPLEXES
Research in Nuclear Chemistry. Progress Report, March 1, 1981-February 28, 1982.
DE81030542 1150

RARE EARTH NUCLEI
Shape of Fast Rotating Heated Nuclei. Calculation Results.
JINR-R-4-12399 1259

RARE EARTHS
Applications of DHDECMP Extraction Chromatography to Nuclear Analytical Chemistry.
DE81030134 1150
Research in Nuclear Chemistry. Progress Report, March 1, 1981-February 28, 1982.
DE81030542 1150

RARE GASES
Mound Facility Activities in Chemical and Physical Research: July-December 1979.
MLM-2727 1240

RARITA-SCHWINGER THEORY
Quantization of the Axial Current for the Massless Rarita-Schwinger Field.
NORDITA-78-19 1261

RAYLEIGH SCATTERING
Depolarized Rayleigh Spectra of Siloxane Polymers.
AD-A107 161/2 1195

RCA SATCOM SATELLITES
Mission Operation Report: Rca-D/delta Launch.
N82-11102/2 1273

REACTION KINETICS
Quantum-Mechanical Studies on Chemical Reactivity and Ballistic Chemistry. VII. Semiempirical Molecular Orbital Calculations and Experimental Studies on Relative Chemical Reactivities of Isomeric Tetrazole Derivatives, and their Relationship to the Explosive Properties of some Tetrazole Derivatives.
AD-A107 288/3 1250
SPH Homogeneization Method.
CEA-CONF-4492 1249
Electron-Impact-Ionization Cross Sections and Rates for Highly Ionized Berylliumlike Ions.
PB82-137332 1153
Cross Sections and Rates for Direct Electron-Impact Ionization of Sodiumlike Ions.
PB82-137340 1153
Kinetics of Gas Hydrate Formation. Part I: Kinetics of Ethane Gas Hydrate Formation. Part II: Kinetics of Natural Gas Hydrate Formation.
PB82-138868 1153

REACTION TIME
Target Information Processing: The Effects on Reaction Time of Terrain, Downlook Angle, and Response Processing Level.
AD-A107 295/8 1111

REACTIVITY
Real Time Program for Reactivity Calculations in Nuclear Reactors.
KFKI-1979-07 1249

REACTOR ACCIDENTS
Greater Commitment Needed to Solve Continuing Problems at Three Mile Island.
AD-A106 915/2 1242
Congress Should Increase Financial Protection to the Public from Accidents at DOE Nuclear Operations.
AD-A106 917/8 1242

REACTOR CORE DISRUPTION
Computational Methods for LMFBR Whole-Core Accident Analysis.
LA-UR-80-1459 1247

REACTOR CORES
Optimization of Radially Heterogenous 1000-MW(E) LMFBR Core Configurations. Appendix C. Research Project 620-25.
EPRI-NP-1000(V.3) 1247

REACTOR KINETICS
Transport and Reactor Theory. Progress Report, April 1-June 30, 1979.
LA-8057-PR 1249

REACTOR MAINTENANCE
Nuclear Reactor Maintenance Technology Assessment. Final Summary Report, September 16, 1978-September 15, 1979.
DE81025021 1242

REACTOR MATERIALS
Seminar on Countermeasures for Pipe Cracking in BWRs.
DE82900055 1247

REACTOR TECHNOLOGY
Reactor Technology. Progress Report, January-March 1980.
LA-8403-PR 1247

READING
Technical Communication--Taking the User into Account.
AD-A107 030/9 1107

REAL ESTATE
Real Estate Closing Costs: Real Estate Settlement Procedures Act (RESPA), Section 14a. Volume I: Executive Summary.
PB82-144999 1101

REAL PROPERTY
Economic Analysis of the Single Family Property Disposition Program.
PB82-144395 1100
Real Estate Surveys, Studies, and Statistics. 1970-1981 (Citations from the NTIS Data Base).
PB82-859547 1102

REAL TIME OPERATION
Automated Water Monitor System Field Demonstration Test Report. Volume 2: Technical Summary.
N82-11992/6 1209

KEYWORD INDEX

REASONING
Spatial Learning and Reasoning Skill.
AD-A107 345/1 1112

RECALL
Long and Short-Term Memory Processes in Cortically Damaged Patients.
AD-A107 258/6 1123

Informant Accuracy in Social Network Data V: An Experimental Attempt to Predict Actual Communication from Recall Data.
PB82-131210 1112

RECLAMATION
Materials Recycling: An Overview of the Mineral Waste Utilization Symposium (6th).
PB82-133828 1213

RECOIL MECHANISMS
Muzzle Flow in the Presence of an Anti-Recoil Plate: Exploratory Study.
AD-A107 314/7 1251

RECORDING SYSTEMS
IRIG-TIME Synchronized Binary Video Data Inserter.
AD-A107 119/0 1233

RECORDS MANAGEMENT
Records Filing, Maintenance and Disposition Study for Department of the Army.
AD-A107 079/6 1094

RECOVERY
Greater Commitment Needed to Solve Continuing Problems at Three Mile Island.
AD-A106 915/2 1242

RECREATION
Health and Safety Deficiencies Found at Water Recreation Areas.
AD-A106 827/9 1122

DOD Can Increase Revenues Through Better Use of Natural Resources It Holds in Trust.
PB82-134040 1213

RECREATIONAL FACILITIES
Trends in Recreational Use of National Forest Wilderness.
PB82-134297 1114

Vacation Farm Cooperatives,
PB82-134388 1080

RECRUITERS
Recruiting Malpractice: Extent, Causes, and Potentials for Improvement.
AD-A106 844/4 1105

RECRUITING
Recruiting Malpractice: Extent, Causes, and Potentials for Improvement.
AD-A106 844/4 1105

RECRYSTALLIZATION
Transient Annealing of Arsenic-Implanted Silicon Using a Graphite Strip Heater.
AD-A107 230/5 1222

RECTANGLES
Surface-Tension Induced Instabilities: Effects of Lateral Boundaries.
N82-11390/3 1262

RECTANGULAR BODIES
Electromagnetic Transmission through a Rectangular Aperture in a Perfectly Conducting Plane.
AD-A107 521/7 1264

RECYCLED MATERIALS
Proceedings, U.S. Department of Commerce Public Workshop on Critical Materials Needs in the Aerospace Industry, February 9-10, 1981,
PB82-137266 1193

RED TIDE
Red Tide: Taxonomy and Life Cycle. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859703 1122

REDOX FUEL CELLS
Design and Assembly Considerations for Redox Cells and Stacks.
DE82000415 1186

REFRACTIVE INDEX
Study of the Two-Photon Photorefractive Effect in Lithium Niobate.
AD-A107 493/9 1256

REFRACTORIES
Design, Engineering and Evaluation of Refractory Liners for Slagging Gasifiers. Sixth Quarterly Technical Progress Report, No. M6043-6(QTPR).
IITRI-M-6043-6(QTPR) 1268

REFRACTORY COATINGS
Use of Titanium to Enhance Wetting of Reaction-Bonded Silicon Nitride by Silicon.
AD-A107 344/4 1190

REFRACTORY MATERIALS
Trends in High Temperature Gas Turbine Materials.
N82-11182/4 1193

REFRIGERATORS
Saving Half of California's Energy and Peak Power in Buildings and Appliances Via Long-Range Standards and Other Legislation.
LBL-6865 1182

REGENERATORS
High Temperature Metallic Recuperator.
PB82-141102 1202

REGIONAL PLANNING
Housing Demand Models and Housing Market Models for Regional and Local Planning,
PB82-137027 1114

Remote Sensing Applied to Urban and Regional Planning. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802562 1217

REGIONS
Annual Housing Survey: 1978. United States and Regions. Part A: General Housing Characteristics.
PB82-144882 1118

Annual Housing Survey: 1978. United States and Regions. Part C: Financial Characteristics of the Housing Inventory.
PB82-144890 1119

REGRESSION ANALYSIS
Spectral Estimation Technology.
AD-A107 031/7 1196

REGULATIONS
Joining the Defense Directives and Defense Acquisition Regulatory Systems,
AD-A107 142/2 1230

Comments on Interior's Surface Mining Regulations.
AD-A107 185/1 1161

The States Regulate Cable: A Legislative Analysis of Substantive Provisions,
PB82-128984 1234

Taxation, Regionalization and Pole Attachments: A Comparison of State Cable Television Policies,
PB82-128992 1234

The Regulation of Cable Television Subscriber Rates by State Commissions,
PB82-129008 1234

The Economic Impact of State Cable TV Regulation,
PB82-129016 1235

Federal Preemption of State Regulation in Cable Television,
PB82-129024 1235

Chronology of Cable Television Regulation: 1947 - 1978,
PB82-129032 1235

Executive Summary of Findings of the State Cable Television Regulation Project,
PB82-129040 1235

An Analysis of the Scope of Federal Laws and Regulations Controlling Exposures to Substances Which Cause Occupational Respiratory and Pulmonary Diseases.
PB82-134198 1103

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume V: Public Regulation,
PB82-144361 1100

REGULATORS
Multivariable Pole Assignment Self Tuning Regulators,
PB82-135674 1199

REHABILITATION
Advancement in Drug Free Therapeutic Community Treatment.
PB82-132796 1114

REIMBURSEMENTS
Physicians and Financial Incentives,
PB82-133695 1132

Issues in Physician Reimbursement: Conference Proceedings,
PB82-135757 1132

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Executive Summary.
PB82-136144 1133

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume I: Description of the Experiment.
PB82-136151 1133

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume II: Process Evaluation.
PB82-136169 1133

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume III: Provider Questionnaire.
PB82-136177 1133

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume IV: Beneficiary Survey.
PB82-136185 1133

Differential Reimbursement of Hospitals.
PB82-138124 1134

Medicaid Nursing Home Reimbursement in Minnesota (Volume 3),
PB82-139908 1134

Medicaid Nursing Home Reimbursement in Connecticut (Volume 6),
PB82-139916 1134

Medicaid Nursing Home Reimbursement in Colorado (Volume 7),
PB82-139924 1134

Medicaid Nursing Home Reimbursement in Louisiana (Volume 8),
PB82-139932 1134

A Profile of the Medical Technology Industry and Governmental Policies: A Study of the Effects of Medicare/Medicaid Reimbursement and the 1976 Medical Device Amendments on the Pacemaker Industry. Volume II.
PB82-141839 1100

REINFORCED CONCRETE
Concrete Mechanics. Part B. Numerical Modelling of Bond-Slip Behaviour,
PB82-132713 1219

Concrete Mechanics. Part C. Numerical Models for Reinforced Concrete Structures in Plane Stress,
PB82-132721 1219

REINFORCED SHELLS
Fabrication and Wear Test of a Continuous Fiber/Particulate Composite Total Surface Hip Replacement.
N82-11211/1 1140

REINFORCING STEELS
Concrete Mechanics. Part B. Numerical Modelling of Bond-Slip Behaviour,
PB82-132713 1219

Acceptance Sampling of Steel Reinforcing Bars.
PB82-135690 1220

RELATIONAL DATA BASES
Addition of Data Feature for FEASIL. Supplement.
AD-A106 992/1 1171

RELATIVITY THEORY
Special Relativistic Two-Body Problem. 1. Past.
JINR-E-2-12390 1261

RELIABILITY
Third National Reliability Conference Birmingham, England.
AD-A107 449/1 1173

An Approach for Assessing Missile System Dormant Reliability.
AD-A107 519/1 1232

Analysis of Complete Logical Structures in System Reliability Assessment,
PB82-138363 1242

RELIABILITY ENGINEERING
Liquid Oxygen Turbopump Technology.
N82-11468/7 1225

RELIGION
Saudi Arabia: The Flexibility of Islamic Fundamentalism,
AD-A106 930/1 1102

RELOCATION
The Veterans Administration's Efforts to Consolidate Computer Programming Resources at a Single Location.
AD-A107 197/6 1108

REMOTE HANDLING EQUIPMENT
Mockup Testing of Remote Systems for Zirconium Fuel Dissolution Process at the Idaho Chemical Processing Plant.
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DE81025021 1242

REMOTE SENSING
Shuttle Applications in Tropospheric Air Quality Observations.
N82-11635/1 1209

Laser Induced Fluoroescence from Algae: Results of a Ship-Borne Field Test.
N82-11758/1 1121

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REMOTE SENSORS
Technology Transfer of NASA Microwave Remote Sensing System.
N82-11515/5 1228

REMOTELY PILOTED VEHICLES
Techniques for the Computation of Wind, Ceiling, and Extinction Coefficient Using Currently Acquired RPV Data.
AD-A107 094/5 1085

Parametric Study of Microwave-Powered High-Altitude Airplane Platforms Designed for Linear Flight.
N82-11050/3 1077

RENEWABLE ENERGY SOURCES
Strategic Analysis of Conservation and Solar Energy Policies.
DE82000252 1181

REPLACEMENT
FAA's Communications Equipment Replacement Plans.
AD-A107 186/9 1233

REPLACEMENT THEORY
Applications of Renewal Theory in Analysis of the Free-Replacement Warranty.
AD-A107 086/1 1089

REPORTING
Rape Reporting: Causes and Consequences,
PB82-133380 1114

REPORTS
Burdensome and Unnecessary Reporting Requirements of the Public Utility Regulatory Policies Act Need to be Changed.
AD-A106 904/6 1180

REQUIREMENTS
Management Improvement Needs of Disadvantaged Communities.
PB82-144973 1094

RESCUE SYSTEMS
Evaluation of the Seismic System for Locating Trapped Miners.
PB82-138660 1167

RESEARCH
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Department of Transportation Awards to Academic Institutions in Fiscal Year 1980,
PB82-141508 1216

RESEARCH AND DEVELOPMENT
Biotechnology in Agricultural Research (Biotechnologie in het Landbouwkundig Onderzoek).
PB82-140450 1134

RESEARCH MANAGEMENT
Ineffective Management of the Appropriate Technology Small Grants Program.
AD-A106 882/4 1088

Unresolved Issues Resulting from Changes in DOE's Synthetic Fuels Commercialization Programs.
AD-A106 883/2 1266

Analysis of Federal Funding for Electric Utility R&D Projects.
AD-A106 888/1 1088

Elimination of Federal Funds for the Heber Project will Impede Full Development and Use of Hydrothermal Resources.
AD-A106 916/0 1180

Follow-Up on Actions to Improve Coordination and Utilization of Human Resources Research and Development.
AD-A107 179/4 1107

Preliminary Analysis of Technical Risk and Cost Uncertainty in Selected DARPA Programs.
AD-A107 402/0 1090

Soviet Science and Technology Policy--Translation.
JPRS-79119 1228

Proposition 13 Research Inventory: A Partial Inventory of Research in the State of California and Elsewhere,
PB82-144429 1216

RESEARCH PROJECTS
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Recent Awards: October-December 1978.
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ORD Extramural Program Guide FY 1981,
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Twenty-Five Innovations from Abroad.
PB82-138322 1093

Fiscal Year 1981 Research and Technology Program.
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RESEARCH REACTORS
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PB82-138157 1096

RESERVES (ENERGY)
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AD-A106 923/6 1266

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AD-A107 196/8 1266

Status of Strategic Petroleum Reserve Activities.
AD-A107 373/3 1266

RESERVOIR OPERATION
Colorado River Simulation System: An Executive Summary,
PB82-139387 1161

RESERVOIR RELEASES
Simulated Interactions between the Proposed Narrows Reservoir and the Water-Table Aquifer Along the South Platte River, Morgan County, Colorado.
PB82-131483 1211

RESERVOIR ROCK
Formation Evaluation in Liquid-Dominated Geothermal Reservoirs.
DOE/ET/28384-T1 1162

RESERVOIRS
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PB82-131483 1211

Colorado River Simulation System: An Executive Summary,
PB82-139387 1161

RESIDENTIAL AREAS
Effects of Aircraft Noise on the Equilibrium of Airport Residents: Testing and Utilization of a New Methodology.
N82-11636/9 1112

RESIDENTIAL BUILDINGS
Evaluation of Residential Building Energy-Performance Standards.
LBL-9816 1201

Development and Field Verification of a Model of House Air Infiltration for Single Family Residences.
PB82-141110 1226

Post Occupancy Evaluation of Housing.
PB82-144296 1115

Fire Endurance Under Design Load for Walls of One-Story Three-Room Structures of Sandwich and Wood-Frame Construction,
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RESIDUAL FUELS
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RESISTANCE
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RESOLUTION
Some Factors Affecting Angular Resolution in an Adaptive Antenna.
AD-A107 056/0 1178

A Two-Dimensional Finite Element Advection Model with Variable Resolution.
AD-A107 511/8 1086

RESOLVERS
Focal Axis Resolver for Offset Reflector Antennas.
PAT-APPL-6-308 009 1179

RESONANCE PARTICLES
Correlations of Identical Particles in the "Resonance + Particle" System.
JINR-R-2-12302 1258

RESOURCE CONSERVATION
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METC/SP-79/9 1166

RESOURCE DEVELOPMENT
Environmental Impacts Associated with Using Peat for Energy.
DE81032000 1209

BIGMAC: Basic Interactive Geothermal Model with Aquifer Characterization; A User's Guide,
PB82-128679 1183

Strategies for State Participation in OCS Exploration Decisions: Onshore Facilities Related to Offshore Oil and Gas Development.
PB82-136482 1184

RESOURCE MANAGEMENT
Supply Workload Implications of Increased Deployment to the Indian Ocean.
AD-A106 994/7 1230

Overview of Considerations in Assessing the Biomass Potential of Army Installations.
AD-A107 132/3 1266

Follow-Up on Actions to Improve Coordination and Utilization of Human Resources Research and Development.
AD-A107 179/4 1107

Information on Peanut Allotment Owners that Lease and Rent Away Rather Than Plant Their Peanut Allotments/Quotas.
AD-A107 377/4 1079

Cooperative Extension Service's Mission and Federal Role Need Congressional Clarification.
AD-A107 482/2 1102

RESOURCE RECOVERY FACILITIES
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RESOURCES
US Energy Sources and Materials Needs.
LASL-80-10(BRIEF) 1182

RESPIRATORS
Protection Factors of the Airstream Helmet.
PB82-135575 1143

RESPIRATORY SYSTEM
An Evaluation of the National Heart, Lung and Blood institute's Pulmonary Academic Award Program.
PB82-141326 1135

RESPONSE SURFACE METHODOLOGY
RSM Development for Nuclear Safety Analysis. A Test Problem.
PB82-138389 1242

RESPONSES
Effects of Time-Varying Noise on Annoyance: A Review,
PB82-133513 1112

RETAIL TRADE
Future Developments in the Food Industry: Probable Efforts at Vertical Integration by Food Retailers.
PB82-132374 1098

RETINA
Dopamine Depletion Slows Retinal Transmission.
PB82-127432 1142

A New Concept on Chiasmal Architecture and Its Projection on the Retina,
PB82-136060 1133

RETIREMENT
Delays in Receiving and Investing Taxes are Reducing Railroad Retirement Program Interest Income.
AD-A106 861/8 1105

RETIREMENT (PERSONNEL)
Tightening Eligibility Standards Could Cut Involuntary Retirement Costs by Millions of Dollars.
AD-A106 842/8 1105

Military Retention and Retirement. Reciprocal Family/Organization Effects,
AD-A107 349/3 1113

REUSABLE HEAT SHIELDING
High Temperature Glass Thermal Control Structure and Coating.
PAT-APPL-6-308 007 1190

REVEGETATION
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Can Community Economic Development Meet the Fiscal Needs of Municipalities. Economic Growth and Fiscal Stress in Three Northeast Cities,
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PB82-144528 1093

REVENUE SHARING
Delays in Receiving and Investing Taxes are Reducing Railroad Retirement Program Interest Income.
AD-A106 861/8 1105

Options for Establishing an Energy Conservation Consolidated Grant Program.
AD-A106 919/4 1180

REVERSE-FIELD PINCH
Magnetic Islands and Stochastic Field Lines in the RFP.
LA-UR-80-2406 1239

Stable Heating and Burn Simulations of a Reversed-Field Pinch Reactor.
LA-UR-80-2500 1239

REVETMENTS
Some Observations on the Economics of 'Overdesigning' Rubble-Mound Structures with Concrete Armor.
AD-A107 240/4 1205

REVIEWS
Non-Contacting Suspension and Propulsion Systems for Transportation Applications,
PB82-135591 1221

REYNOLDS NUMBER
Computation of High Reynolds Number Internal/External Flows.
N82-11046/1 1254

REYNOLDS STRESS
Numerical Simulation of a Compressible Homogeneous, Turbulent Shear Flow.
N82-11396/0 1254

RHEOLOGICAL PROPERTIES
Static Penetrometer for Soft and Loose Soils (Penetrometro Estatico Para Suelos Blandos Y Sueltos),
PB82-135401 1170

RHEOLOGY
Estimation of the Homogenization Temperature of a 1.2 Polybutadiene/1.4 Polybutadiene Diblock Copolymer Using Rheological Testing Methods.
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RIBONUCLEIC ACIDS
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RICE BRAN
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AD-A106 955/8 1122

Rickettsia tsutsugamushi Antibody in Mother/Cord Pairs of Sera.
AD-A106 957/4 1122

RICKETTSIAL DISEASES
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RIDE QUALITY
Collection and Use of Pavement Condition Data.
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ORO-3852-37 1248

RISK
Risk of Inner-City Mortgage Lending,
PB82-144627 1101

RISK ASSESSMENT
Determination of the Statistical Distributions of Model Parameters for Probabilistic Risk Assessment.
DE82000147 1197

RIVER BASINS
Saco and Southern Maine Coastal River Basins Overview.
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ROADS
Pothole Primer. A Public Administrator's Guide to Understanding and Managing the Pothole Problem.
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Surface Dressing in Developing Countries: Research in Kenya,
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ROCK CLASSIFICATION
Reproducibility of Joint Spacing Measurements in Rock,
PB82-135344 1159

ROCK MECHANICS
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ROCKS
Reproducibility of Joint Spacing Measurements in Rock,
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ROCKY MOUNTAIN SPOTTED FEVER
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ROLES (BEHAVIOR)
Fathering and the Pediatric Cancer Experience.
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ROOM AND PILLAR MINING
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ROTARY WINGS
Aeroacoustic Theory for Noncompact Wing-Gust Interaction.
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Helicopter Rotor Trailing Edge Noise.
N82-11859/7 1078

ROUTES
Determining Optimum Routes from Maps,
PB82-135310 1214

ROUTING
The Single and Multiple Vehicle Pickup and Delivery Problem: Exact and Heuristic Algorithms.
AD-A107 202/4 1199

RUBBLE MOUND BREAKWATERS
Some Observations on the Economics of 'Overdesigning' Rubble-Mound Structures with Concrete Armor.
AD-A107 240/4 1205

RUNOFF
Guidelines for Calibration and Application of STORM Addendum. Description of SCS Method of Runoff Determination as Programmed in STORM.
AD-A107 077/0 1159

RURAL AREAS
Techniques for Analyzing the Performance of Rural Transit Systems. Volume I.
PB82-106436 1221

Alternative Sign Sequences for Work Zones on Rural Highways. Executive Summary.
PB82-132812 1213

RUTGERS COMPOSTING PROCESS
Sludge Composting and Utilization: Rational Approach to Process Control.
PB82-136243 1269

RUTHENIUM COMPLEXES
Excited-State Proton Transfer Kinetics in 1-Naphthol Compounds and Organometallic Complexes.
LA-UR-80-1928 1151

SAFEGUARDS
Pathfinding Simulation (PATHS) User's Guide,
NUREG/CR-1589 1249

SAFETY
Health and Safety Deficiencies Found at Water Recreation Areas.
AD-A106 827/9 1122

Improvements Needed in Assessing Penalties and Controlling Penalty Collections Resulting from Occupational Safety and Health Inspections.
AD-A106 848/5 1138

Windshield Damage and Driving Safety.
PB82-128653 1225

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PB82-131699 1212

RSM Development for Nuclear Safety Analysis. A Test Problem,
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SAINT FRANCIS RIVER BASIN
Lake Memphremagog-St. Francis River Basin Overview.
PB82-108101 1160

SAINT PAUL'S ROCKS
St. Peter and St. Paul's Rocks (Equatorial Atlantic) and the Surrounding Sea Floor.
PB82-139403 1159

SALARIES
Serious Problems Need to be Corrected before Federal Merit Pay Goes into Effect.
AD-A106 843/6 1105

Alternatives to the Current Method of Computing General Schedule Pay.
AD-A107 178/6 1107

Problems with the Small Business Administration's Merit Appraisal and Compensation System.
AD-A107 181/0 1107

SALES
Cooperative Farm Machinery Operations: Oregon and Wisconsin,
PB82-134123 1080

Economic Analysis of the Single Family Property Disposition Program.
PB82-144395 1100

SALES MANAGEMENT
Initial Public Offerings of Common Stock: The Role of Regional Broker-Dealers in the Capital Formation Process: Phase I Report.
PB82-135997 1099

The Role of Regional Broker-Dealers in the Capital Formation Process: Underwriting, Market-Making and Securities Research Activities: Phase II Report.
PB82-136003 1099

SALMON FALLS RIVER
Piscataqua and New Hampshire Coastal River Basins Overview.
PB82-107145 1160

SALT DEPOSITS
Analysis of Data from Line-Source Thermal-Conductivity Measurements Taken in Situ in Dome Salt at the Avery Island Mine.
DE82000517 1157

Nuclear Materials Research Progress Reports for 1979.
LBL-11030 1249

SALT WATER
The Density of Caspian Sea Waters.
AD-A107 220/6 1168

SALYUT SPACE STATION
Hungarian Cosmonaut in Space.
N82-11097/4 1272

SAMPLING
Advances in Sample Introduction for Elemental Analysis.
AD-A107 514/2 1150

Chloroacetaldehyde (Analytical Method S11).
PB82-107244 1140

An Evaluation of the New York Area Sampling Frame.
PB82-124413 1080

SANDWICH CONSTRUCTION
Finite Element Techniques for Static Stress and Free Vibration Analysis of Sandwich Composites.
AD-A107 095/2 1226

Minimum Weight Design of Flat Sandwich Panels under Edgewise Compression Loads.
AD-A107 096/0 1226

SANDWICH PANELS
Finite Element Techniques for Static Stress and Free Vibration Analysis of Sandwich Composites.
AD-A107 095/2 1226

Minimum Weight Design of Flat Sandwich Panels under Edgewise Compression Loads.
AD-A107 096/0 1226

SAPPHIRE
Evaluation of the Effects of Solar Radiation on Glasses.
N82-11207/9 1256

SATELLITE ANTENNAS
Space-Based Radar Array System Simulation and Validation.
AD-A106 996/2 1238

Some Factors Affecting Angular Resolution in an Adaptive Antenna.
AD-A107 058/0 1178

SATELLITE ATTITUDE
Kinematics, Dynamics, and Estimation of Rigid-Body Motion Using Euler Parameters (Quaternions).
AD-A107 537/3 1273

SATELLITE ATTITUDE CONTROL
On the Shape and Orientation Control of an Orbiting Shallow Spherical Shell Structure.
N82-11100/6 1272

SATELLITE-BORNE INSTRUMENTS
Magnetic Field Investigation for ISEE Mother and Daughter Spacecraft.
N82-11105/5 1228

SATELLITE COMMUNICATIONS
The Use of Output Moments to Predict Performance of Nonlinear Systems with Gaussian Inputs.
AD-A106 905/3 1178

Technology Assessment for Future EHF MILSATCOM Systems.
AD-A107 059/8 1233

SATELLITE SOLAR ENERGY CONVERSION
Investigation of Direct Solar-to-Microwave Energy Conversion Techniques.
N82-11544/5 1186

SATELLITE TRACKING SYSTEMS
Maui Optical Tracking and Identification Facility Transition Program.
AD-A106 997/0 1273

NAVPAC SST Data Processing--Mathematical Description.
AD-A107 082/0 1171

SAUDI ARABIA
Saudi Perceptions of the International Environment,
AD-A106 927/7 1102

Saudi Arabia: The Flexibility of Islamic Fundamentalism,
AD-A106 930/1 1102

SAVANNAH RIVER PLANT
Operating-Procedure System at Savannah River Plant.
DE81030405 1090

Hydrologic Study of the Unsaturated Zone Adjacent to a Radioactive-Waste Disposal Site at the Savannah River Plant, Aiken, South Carolina.
DE81031984 1159

SAW CONVOLVERS
Electromagnetic Long-Line Effects in Surface Wave Convolvers.
AD-A107 060/6 1252

SCALAR FIELDS
Relativistic Quantum Mechanics of Scalar Field.
JINR-R-2-12395 1259

SCALARS
Mixing of a Passive Scalar in Isotropic and Sheared Homogeneous Turbulence.
N82-11394/5 1254

SCALE (RATIO)
Universal Binding Energy Relations in Metallic Adhesion.
N82-11183/2 1189

SCATTERING COEFFICIENTS
A Model Describing the Microwave Emission from a Multi-Layer Snowpack at 37 Ghz.
N82-11510/6 1169

SCATTERING CROSS SECTIONS
Electron-Impact-Ionization Cross Sections and Rates for Highly Ionized Beryllium-like Ions.
PB82-137332 1153

Cross Sections and Rates for Direct Electron-Impact Ionization of Sodium-like Ions.
PB82-137340 1153

SCHEDULING
Effect of Work Schedule, and Description of Career Intention on Organizational Effectiveness.
AD-A106 819/6 1105

Update of Cost Information Contained in a Previous GAO Report on Specific Aspects of the Clinch River Breeder Reactor Project.
AD-A106 918/6 1246

SCHNEIDER LAKE DAM
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SCHOOL BUILDINGS
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JHU/APL-QM-80-101 1201

SCHOOLS
Efforts to Improve School Lunch Programs--Are They Paying Off.
AD-A106 829/5 1137

SCHRODINGER EQUATION
Upper Limits for the Number of Bound States Associated with the Yukawa Potential,
PB82-140625 1261

SCINTILLATION COUNTERS
Four Input Coincidence Detector.
PAT-APPL-6-222 936 1241

SCOMBEROMORUS CAVALLA
Size and Sex Ratio of King Mackerel, 'Scomberomorus cavalla', in the Southeastern United States.
PB82-109406 1121

SEA ICE
MIZEX. A Program for Mesoscale Air-Ice-Ocean Interaction Experiments in Arctic Marginal Ice Zones. I. Research Strategy.
AD-A107 046/5 1169

USCGC GLACIER 1976 and 1978 Cruises. Rose Sea, Antarctica Sediment Descriptions,
PB82-134503 1159

SEA WATER
International One-Atmosphere Equation of State of Seawater.
AD-A107 209/9 1168

A New High Pressure Equation of State for Seawater.
AD-A107 221/4 1168

The Carbonate System in the Western Mediterranean Sea.
AD-A107 390/7 1168

Development of the Coastal Zone Color Scanner for Nimbus 7. Volume 1: Mission Objectives and Instrument Description.
N82-11511/4 1228

SEALING
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SEALS (STOPPERS)
Preliminary Study of Temperature Measurement Techniques for Stirling Engine Reciprocating Seals.
N82-11466/1 1271

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PB82-856584 1189

SEAPORTS
Port and Harbor Safety. 1974-1981 (Citations from Oceanic Abstracts).
PB82-857939 1227

SEARCH RADAR
A high-Frequency Broadband Transmitter for Monostatic Systems.
AD-A107 088/7 1238

TRACALS Evaluation Report. Airport Surveillance Radar AN/GPN-12. Special Evaluation Report. Salt lake City International Airport and Wendover Auxiliary Airfield, Utah, 3 and 6-15 June 1981.
AD-A107 234/7 1237

TRACALS Evaluation Report. Airport Surveillance and Precision Approach Radar AN/GPN-24(V), Initial Evaluation Report, RAF Upper Heyford, England 11 Mar-25 April 81.
AD-A107 491/3 1237

SECONDARY
Secondary Combustion in Gun Exhaust Flows.
AD-A107 312/1 1251

Energy and Angle Resolve SIMS Studies of CO on Ni(001).
AD-A107 474/9 1149

SECURE COMMUNICATION
Private and Public Defenses Against Soviet Interception of U.S. Telecommunications: Problems and Policy Points,
PB82-129073 1235

SEDIMENTATION
Geoacoustic Modeling of Deep-Sea Carbonate Sediments,
AD-A107 028/3 1168

SEDIMENTS
Geoacoustic Modeling of Deep-Sea Carbonate Sediments,
AD-A107 028/3 1168

Limnological Investigations: Lake Koocanusa, Montana. Part 5. Phosphorus Chemistry of Sediments.
AD-A107 049/9 1159

Procedures for Petrophysical, Mineralogical and Geochemical Characterization of Fine-Grained Clastic Rocks and Sediments.
METC/CR-79/26 1158

Distribution of Actinide Elements in Sediments: Leaching Studies.
ORO-3852-39 1156

Marine Sediment Core Descriptions IWSOE 68, 69, 70; Deep Freeze 79,
PB82-132127 1158

The Scientific Program USCGC Glacier Deep Freeze 80,
PB82-132879 1159

USCGC GLACIER 1976 and 1978 Cruises. Rose Sea, Antarctica Sediment Descriptions,
PB82-134503 1159

SEEDS
Seed-Protein Genes and the Regulation of Their Expression. Progress Report.
DE81030165 1120

SEGMENTED
Cluster Analysis Algorithms for Image Segmentation.
AD-A107 110/9 1172

Image Segmentation with Color and Texture,
AD-A107 479/8 1173

SEISMIC DETECTION
Direct Detection of Hydrocarbons Using Seismic Procedures--Translation.
PB82-137597 1238

Evaluation of the Seismic System for Locating Trapped Miners.
PB82-138660 1167

SEISMIC SIGNATURES
Seismological Discrimination and Yield Determination Research.
AD-A107 360/0 1168

SEISMIC WAVES
Geophysical Signal Recognition.
AD-A107 005/1 1168

Seismological Discrimination and Yield Determination Research.
AD-A107 360/0 1168

An Application of Syntactic Pattern Recognition to Seismic Discrimination,
AD-A107 383/2 1238

SEISMOLOGICAL DISCRIMINATION
Seismological Discrimination and Yield Determination Research.
AD-A107 360/0 1168

SEISMOLOGY
Crustal Structure of the Shatsky Rise from Seismic RefractION Measurements.
AD-A107 027/5 1157

Crustal Deformation and Seismic Measurements in the Region of Mcdonald Observatory, West Texas.
N82-11695/5 1169

Regional Tectonics and Seismicity of Eastern Nebraska.
NUREG/CR-2411 1168

Regional Seismicity. 1976-1981 (Citations from the Energy Data Base).
PB82-858515 1169

SEISMOMETERS
Marine Seismic System At-Sea-Test Deployment Operation. Revision.
AD-A106 991/3 1168

SELENIUM COMPOUNDS
2-Acetylpyridine Thiosemicarbazones. 3. Selenium Analogs as Potential Antimalarial Agents.
AD-A106 958/2 1141

SELENOSEMICARBAZONES
2-Acetylpyridine Thiosemicarbazones. 3. Selenium Analogs as Potential Antimalarial Agents.
AD-A106 958/2 1141

SELF CARE
Self Care. March, 1972-November, 1981 (Citations from the NTIS Data Base).
PB82-802612 1135

SELF ERECTING DEVICES
Study of Foldable Elastic Tubes for Large Space Structure Applications, Phase 3.
N82-11493/5 1273

SELF FOCUSING
Focal Axis Resolver for Offset Reflector Antennas.
PAT-APPL-6-308 009 1179

SELF PROPELLED GUNS
Independent Evaluation Plan for Crew Ballistic Shelter for the M110A2. Revision.
AD-A107 066/3 1250

SELLING COSTS
Real Estate Closing Costs: Real Estate Settlement Procedures Act (RESPA), Section 14a. Volume I: Executive Summary.
PB82-144999 1101

SEMICONDUCTOR DEVICES
Conceptual Problems in Modeling Submicron Device Physics.
AD-A107 159/6 1171

SEMICONDUCTOR LASERS
Fiber-Coupled External-Cavity Semiconductor High-Power Laser.
AD-A107 227/1 1255

Communications: Fiber-Coupled External Cavity Semiconductor Laser.
AD-A107 301/4 1256

SEMICONDUCTORS
Charge Instabilities in Lateral Super-Lattices under Conditions of Population Inversion.
AD-A106 911/1 1262

Trap Studies on GaAs-Si3N4 Interfaces.
AD-A106 990/5 1263

Surface and Defect Excitations in Covalently Bonded Solids.
AD-A107 064/8 1263

Hot-Carrier Microwave Conductivity in the Non-Zero Collision Duration Regime.
AD-A107 120/8 1263

Spatial Separation of Carriers in InAs-GaSb Superlattices.
AD-A107 155/4 1263

Impact Ionization and Hot Carrier Transport in Semiconductors.
AD-A107 386/5 1263

SEMICONDUCTORS (MATERIALS)
Conductivity Mobility, Hall Mobility, and Resistivity in p-Type Silicon.
PB82-135864 1263

SEMITRAILERS
Signal Analysis Van Hardware Operation General Description. Volume 1.
AD-A106 948/3 1238

SEPARATORS
Molecular Sieves. 1976-1981 (Citations from the Energy Data Base).
PB82-858499 1147

Molecular Sieves. 1970-1981 (Citations from the NTIS Data Base).
PB82-858507 1147

SEQUENCING
Computer Metatheory for Sequencing and Database Management. 1976-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-859360 1177

SERODIAGNOSIS
A New Method for Determination of Anti-Double Strand DNA Antibodies, Trypanosoma Equiperdium Immunofluorescent Method,
PB82-129636 1131

Studies on the Rapid Detection of Dengue Virus Antigen by Immunofluorescence and Radioimmunoassay,
PB82-136052 1133

SERVICEABILITY
Collection and Use of Pavement Condition Data.
PB82-131970 1212

SEWAGE TREATMENT
Tallahassee-Leon County Wastewater Management, Tallahassee, Leon County, Florida.
PB82-106428 1209

Wastewater Facilities Southern Region Area, Palm Beach County, Florida.
PB82-108838 1210

Sludge Composting and Utilization: Rational Approach to Process Control.
PB82-136243 1269

User Charge Revenues for Wastewater Treatment Plants--Insufficient to Cover Operation and Maintenance.
PB82-137761 1215

Nitrogen Removal in Sewage Treatment Systems. 1978-November, 1981 (Citations from the NTIS Data Base).
PB82-802653 1217

Sewage Sludge Disposal. 1975-November, 1981 (Citations from the NTIS Data Base).
PB82-802935 1218

Sewage Sludge Disposal. February, 1976-November, 1981 (Citations from the Engineering Index Data Base).
PB82-802943 1218

SEWAGE TREATMENT PLANTS
Tallahassee-Leon County Wastewater Management, Tallahassee, Leon County, Florida.
PB82-106428 1209

Wastewater Facilities Southern Region Area, Palm Beach County, Florida.
PB82-108838 1210

SEX CRIMES
Rape Response: A Research Demonstration Project,
PB82-134511 1132

SHAFTS (MACHINE ELEMENTS)
Failure Analysis of a Tool Steel Torque Shaft.
N82-11184/0 1193

SHALE OIL
Catalytic Combustion with Incompletely Vaporized Residual Fuel.
DE82000419 1265

Partitioning of Major, Minor, and Trace Elements During Simulated in-Situ Oil Shale Retorting.
LBL-9062 1151

SHALES
Experimental Study of the Combustion of Low-Grade Calorific Material with the Aim of Assessing its Utility Value (Etude Experimentale de la Combustion Des Matieres a Faible Pouvoir Calorifique en Vue de Leur Valorisation).
PB82-139460 1269

SHALLOW SHELLS
On the Shape and Orientation Control of an Orbiting Shallow Spherical Shell Structure.
N82-11100/6 1272

SHAPE CONTROL
On the Shape and Orientation Control of an Orbiting Shallow Spherical Shell Structure.
N82-11100/6 1272

SHATTER CONES
A Review of an Attempt to Create Shatter Cones with Magnetic Flyer Plate Technology.
N82-11492/7 1158

SHEAR FLOW
Mixing of a Passive Scalar in Isotropic and Sheared Homogeneous Turbulence.
N82-11394/5 1254

Numerical Simulation of a Compressible Homogeneous, Turbulent Shear Flow.
N82-11396/0 1254

SHEAR STRESS
An Improved Transverse Shear Deformation Theory for Laminated Antisotropic Plates.
N82-11488/5 1262

A Review of an Attempt to Create Shatter Cones with Magnetic Flyer Plate Technology.
N82-11492/7 1158

SHEAR STRESSES
Interactions between Large-Scale Coherent Structures and Fine-Grained Turbulence in Free Shear Flows.
AD-A107 210/7 1253

SHEAR WALLS
Design of Concrete Walls with Shear Failure (Diseno de Muros de Concreto Con Falla Por Cortante),
PB82-135385 1226

SHEETS
A Fracture Limit Diagram for Determining Hydrogen Embrittlement of Sheet under Multiaxial Loading Conditions.
AD-A107 116/6 1191

Localized Necking: An Inclined Imperfection Model.
AD-A107 137/2 1191

SHELLS (STRUCTURAL FORMS)
Collapse Analysis of Three Dimensional Assemblages of Eccentrically Stiffened Hot Rolled Steel Plates and Shallow Shells,
PB82-132697 1262

Geometrical Non-Linearity in Collapse Analysis of Thick Shells, with Application to Tubular Steel Joints,
PB82-132929 1219

SHIELDING
Effectiveness Testing for Antipropagation Shields Developed for M456 Heat Tank Ammunition.
AD-A107 037/4 1250

Calculation of Neutron and gamma Ray Energy Spectra for Fusion Reactor Shield Design: Comparison with Experiment.
ORNL/TM-7360 1240

SHIELDING MATERIALS
Magnesium Hydroxide Neutron-Shielding Material and Method of Producing Such Material.
DE81030298 1242

SHIP BRIDGES
Simulator Evaluation of Electronic Radio Aids to Navigation Displays, the RA-1 Experiment.
AD-A106 941/8 1236

SHIP HULLS
Proceedings of the Thirteenth Symposium on Naval Hydrodynamics Held at Tokyo (Japan) on October 6-10 1980,
AD-A106 987/1 1224

SHIP PERSONNEL
A Descriptive Analysis of First Term Attrition from U.S. Naval Ships.
AD-A107 510/0 1109

SHIPPING
The Worldwide Navigational Warning Service,
AD-A107 372/5 1234

SHIPPING CONTAINERS
Dynamic Analysis to Establish Normal Shock and Vibration of Radioactive Material Shipping Packages.
NUREG/CR-2146-V1 1242

SHIPS
Information on the U.S. Coast Guard's Decision to Purchase the M/V Cowslip Vessel.
AD-A107 374/1 1231

Surface Effect Vehicles/Ships in Marine Environments. 1970-November, 1981 (Citations from the Engineering Index Data Base).
PB82-802844 1224

Surface Effect Vehicles/Ships in Marine Environments. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802851 1224

SHIPWRECKS
A Cultural Resource Survey of the Continental Shelf from Cape Hatteras to Key West. Volume III: Appendices.
PB82-138231 1104

SHOPPING CENTERS
Support Services for the Turtle Mountain Shopping Center.
PB82-134255 1099

SHORES
Mitigation of Shore Damage Attributed to the Federal Navigation Structures at Port Sanilac Harbor, Michigan.
AD-A106 933/5 1204

SHRIMPS
Decapsulation of Brine Shrimp ('Artemia salina') Cysts,
PB82-136631 1121

Controlled Large-Scale Hatching of Brine Shrimp, 'Artemia salina',
PB82-136649 1121

SHUTDOWNS
Greater Commitment Needed to Solve Continuing Problems at Three Mile Island.
AD-A106 915/2 1242

SIDELOBES
Antenna Pattern Modification for Single Reflector Antennas.
N82-11338/2 1264

SIGNAL PROCESSING
The Time-Sequenced Adaptive Filter.
AD-A106 908/7 1178

Active RF Seeker Analysis for Land Combat Seekers.
AD-A106 947/5 1238

Signal Analysis Van Hardware Operation General Description. Volume 1.
AD-A106 948/3 1238

Geophysical Signal Recognition.
AD-A107 005/1 1168

Digital Signal Processing Research.
AD-A107 124/0 1177

Digital Signal Sorting for Digitized Speech in an Environment of Common Digital Data Signals.
AD-A107 266/9 1233

Modulation/Demodulation Techniques for Satellite Communications. Part 4: Appendices.
N82-11341/6 1234

SILICA
Coal Liquefaction Research, October 1, 1978-September 30, 1981.
DE81030379 1267

Chemistry of Silica in Cerro Prieto Brines.
LBL-10166(Rev.) 1158

SILICA GLASS
Space Processing of Electronic Materials.
N82-11094/1 1222

Evaluation of the Effects of Solar Radiation on Glasses.
N82-11207/9 1256

SILICON
Theoretical and Experimental Investigation of the Dynamics of Pulsed Laser Annealing of Amorphous Silicon.
AD-A106 855/0 1262

Radiation Damage Processes in Silicon,
AD-A107 170/3 1252

Use of Titanium to Enhance Wetting of Reaction-Bonded Silicon Nitride by Silicon.
AD-A107 344/4 1190

Neutron-Capture gamma-Ray Analysis of Coal for Sulfur, Iron, Silicon and Moisture.
IS-T-847 1165

Nuclear Materials Research Progress Reports for 1979.
LBL-11030 1249

The Effects of Impurities on the Performance of Silicon Solar Cells.
N82-11548/6 1187

Conductivity Mobility, Hall Mobility, and Resistivity in p-Type Silicon.
PB82-135864 1263

SILICON CARBIDES
Microhardness, Friction and Wear of SiC and Si3N4 Materials as a Function of Load, Temperature and Environment.
AD-A107 501/9 1189

Erosion-Corrosion-Wear Program.
LBL-11109 1192

Silicon Carbide as an Oxidation-Resistant High-Temperature Material. 1: Oxidation and Heat Corrosion Behavior.
N82-11120/4 1189

Materials Analyses of Ceramics for Glass Furnace Recuperators.
ORNL/TM-6970 1190

SILICON DIOXIDE
Effects of a Thin SiO2 Layer on the Formation of Metal-Silicon Contacts.
AD-A107 121/6 1263

SILICON NITRIDES
Trap Studies on GaAs-Si3N4 Interfaces.
AD-A106 990/5 1263

Use of Titanium to Enhance Wetting of Reaction-Bonded Silicon Nitride by Silicon.
AD-A107 344/4 1190

Microhardness, Friction and Wear of SiC and Si3N4 Materials as a Function of Load, Temperature and Environment.
AD-A107 501/9 1189

Materials Analyses of Ceramics for Glass Furnace Recuperators.
ORNL/TM-6970 1190

SILOXANES
Photon Correlation Spectroscopy of Bulk Siloxane Polymers.
AD-A107 153/9 1195

Depolarized Rayleigh Spectra of Siloxane Polymers.
AD-A107 161/2 1195

SILVER
Flotation Separation of Gold and Silver Particles. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859406 1194

SIMPLEX A MODEL
SIMPLEX 'A' - A Simplified Atmospheric Dispersion Model for Airport Use (Users Guide).
AD-A107 320/4 1205

SIMULATION
Determination of the Relationship between Information Capacity and Identification by Simulated Aerial Photography.

AD-A107 485/5 1230

SIMULATORS

Simulation Testing of Weapon Systems.
AD-A106 821/2 1251

Simulator Evaluation of Electronic Radio Aids to Navigation Displays--The Miniexperiment.
AD-A107 072/1 1236

SINGLE CRYSTALS

Vapor-Phase Epitaxy of GaInAsP and InP.
AD-A107 053/1 1252

Application of the Semicontinuum Potential Model to Deduce Localized Electron Trapping Sites in Single Crystals of D-Sorbitol.
AD-A107 156/2 1149

Growth of Solid Solution Single Crystals.
N82-11958/7 1253

SINGLE FAMILY HOUSES

Economic Analysis of the Single Family Property Disposition Program.
PB82-144395 1100

SITE SURVEYS

Project Lame 80F: A Cultural Resource Survey Around Boulder Beach, Echo Bay, Temple Bar and Cottonwood Cove in the Lake Mead National Recreation Area Clark County, Nevada and Mohave County, Arizona,
PB82-109364 1104

Architectural and Historical Survey on Approximately 121,265 Acres in Central North Dakota.
PB82-109422 1104

SITES

Installation Restoration Program. Phase I. Records Search, Hazardous Materials Disposal Sites. Myrtle Beach AFB, South Carolina.
AD-A107 358/4 1205

SKID RESISTANCE

Development of a Test Trailer for High-Volume Skid-Resistance Surveys.
PB82-135872 1214

SKILLS

Initial Skill Training for Navy Enlisted Personnel.
AD-A107 177/8 1107

Spatial Learning and Reasoning Skill.
AD-A107 345/1 1112

SKIN (ANATOMY)

Research and Development: Systems for Transmitting Energy Through the Intact Skin.
PB82-129321 1142

SLAGS

Final Report on Grant No. DE-FG21-78ET13383.
DE81029479 1264

SLIDING

Analysis of Continuous Beams with Joint Slip.
AD-A107 112/5 1221

SLUDGE DISPOSAL

Sludge Composting and Utilization: Rational Approach to Process Control.
PB82-136243 1269

Sewage Sludge Disposal. 1975-November, 1981 (Citations from the NTIS Data Base).
PB82-802935 1218

Sewage Sludge Disposal. February, 1976-November, 1981 (Citations from the Engineering Index Data Base).
PB82-802943 1218

SMALL BUSINESSES

SBA's Progress in Implementing the Public Law 95-507 Subcontracting and Surety Bond Waiver Provisions Has Been Limited.
PB82-133844 1092

SMALL FARMS

Vacation Farm Cooperatives,
PB82-134388 1080

SMOKE MUNITIONS

Evaluation of Replacement Red Smoke Dyes for 1-N Methylaminoanthraquinone.
AD-A107 286/7 1190

SMOKING

Smoking and Health, A Report of the Surgeon General.
PB82-141300 1135

SNG PLANTS

Environmental Assessment: Allocation of Petroleum Feedstock, Columbia LNG Corporation, Green Springs SNG Plant, Green Springs, Seneca County, Ohio.
DOE/EA-0061 1209

SNOW

Proceedings of the International Society for Terrain-Vehicle Systems Workshop on Snow Traction Mechanics, Alta, Utah, 29 January-2 February 1979.
AD-A106 972/3 1250

A Macroscopic View of Snow Deformation under a Vehicle.
AD-A107 038/2 1169

A Model Describing the Microwave Emission from a Multi-Layer Snowpack at 37 Ghz.
N82-11510/6 1169

Design Criteria for Avalanche Control Structures in the Runout Zone.
PB82-108093 1169

SOCIAL EFFECT

Alaska OCS Socioeconomic Studies Program: St. George Basin Petroleum Development Scenarios, Anchorage Impact Analysis.
PB82-139825 1216

SOCIAL SCIENCES

Interpersonal Relations Among Hispanics in the United States: A Content Analysis of the Social Science Literature.
AD-A107 460/8 1113

SOCIAL SECURITY

Allocation of an Air Force Contractor's Pension Fund Assets May be Inequitable.
AD-A107 375/8 1090

SOCIAL WELFARE

States' Efforts to Detect Duplicate Public Assistance Payments.
AD-A106 846/9 1113

Follow-Up Review to Determine the Extent to Which the Department of Health and Human Services has Implemented the Recommendations in Our Report: 'Increased Federal Efforts Needed to Better Identify, Treat, and Prevent Child Abuse and Neglect'.
AD-A106 849/3 1113

Special Estate Tax Provisions for Farmers Should be Simplified to Achieve Fair Distribution of Benefits.
AD-A106 857/6 1102

Concerns about HHS' Ability to Effectively Implement Incentive Funding for State Information Systems in the Aid to Families with Dependent Children Program.
AD-A106 871/7 1088

Ohio's 1981 Home Energy Assistance Program.
AD-A106 872/5 1180

Cooperative Extension Service's Mission and Federal Role Need Congressional Clarification.
AD-A107 482/2 1102

SOCIOMETRICS

The Networkers Network: A Study of the Impact of a New Communications Medium on Sociometric Structure.
PB82-130386 1114

SODASORB

Carbon Dioxide Absorption Characteristics of High Performance Sodasorb at 1 Atmosphere.
AD-A107 488/9 1140

SODIUM CHLORIDE

Adiabatic Partial Molal Compressibilities of Electrolytes in 0.725m NaCl Solutions at 25 c.
AD-A107 223/0 1149

SODIUM COMPOUNDS

Determination of Sodium Gluconate in Corrosion-Removing Compounds.
AD-A107 244/6 1149

SODIUM FLUORIDES

Comparison of the Caries-Preventive Effects of Neutral Sodium Fluoride and Acidulated Phosphate Fluoride.
PB82-135203 1132

SODIUM IONS

Cross Sections and Rates for Direct Electron-Impact Ionization of Sodiumlike Ions.
PB82-137340 1153

SODIUM PHOSPHATES

Aqueous Dissolution of Calcium Metaphosphate Glasses.
DE81030130 1189

Behavior of Alkali Metal-Acid Phosphates During Elevated Temperature Water Electrolysis.
DE82000243 1267

SODIUM SULFATES

Thermal Energy Storage: Glauber's Salt. 1976-1981 (Citations from the Energy Data Base).
PB82-859091 1189

SOFTWARE

INFO: The JHU/APL Information Package.
PB82-121740 1174

Patch Macro and Load Module (IRSPATCH).
PB82-121765 1174

COBOL Analysis and Translate System (CATS).
PB82-121773 1174

Methods and Standards System.
PB82-121799 1091

File Analysis and Selection Technique (FAST).
PB82-121815 1095

Label Utility System.
PB82-121831 1095

CLMTIC3 - Tally Incidence of Characters.
PB82-121856 1175

COPY3 - Copy Sequential Data Sets.
PB82-121864 1175

Plotting Routines NOMEN and CLINE.
PB82-121872 1175

COBOL Structured Code Analyzer.
PB82-121880 1175

DSMS Update System.
PB82-121898 1095

EEO System.
PB82-121914 1109

COBOL Audit and Debugging Aid (CADA INSERT).
PB82-121930 1175

SOFTWARE ENGINEERING

Patch Macro and Load Module (IRSPATCH).
PB82-121765 1174

COBOL Analysis and Translate System (CATS).
PB82-121773 1174

COBOL Analysis and Translate System (CATS). Technical Note.
PB82-121781 1175

COBOL Audit and Debugging Aid (CADA INSERT).
PB82-121930 1175

COBOL Audit and Debugging Aid (CADA INSERT). Technical Note.
PB82-121948 1175

Project RMAG: SLANG (Structured Language) Compiler,
PB82-127267 1175

Test Problems and Results for OMNITAB 80.
PB82-136474 1176

SOFTWARE TOOLS

Synopsis of Interviews from a Survey of Software Tool Usage,
PB82-133521 1175

Computer Science and Technology: A Survey of Software Tools Usage.
PB82-134743 1176

SOIL ANALYSIS

Methyl Parathion Persistence in Soil Following Simulated Spillage.
PB82-127549 1170

SOIL DYNAMICS

Probabilistic Analysis of Seismic Response of Multi-Supported Structures on Soft Soils (Analisis Probabilistico de la Respuesta Sismica de Estructuras Sobre Varios Apoyos en Suelos Blandos),
PB82-135377 1226

SOIL EROSION

Southeastern Soil Erosion Control and Water Quality Workshop, November 19-21, 1980, Nashville, Tennessee.
PB82-139502 1081

SOIL MECHANICS

HOMEP - An Algorithm for Analysing Homogeneous Stress/Strain Histories,
PB82-134644 1170

SOIL MICROBIOLOGY

Atmospheric Benzene Depletion by Soil Microorganisms.
PB82-126293 1170

SOIL MOISTURE

Evaluation of Gravimetric Ground Truth Soil Moisture Data Collected for the Agricultural Soil Moisture Experiment, 1978 Colby, Kansas, Aircraft Mission.
N81-29494/4 1169

Soil Moisture Inferences from Thermal Infrared Measurements of Vegetation Temperatures.
N81-29500/8 1169

Descriptive and Sensitivity Analyses of Watbal: A Dynamic Soil Water Model.
N81-29507/3 1170

An Evaluation of the Spatial Resolution of Soil Moisture Information.
N82-11513/0 1170

SOIL PROPERTIES

A Review of Numerical Methods for the Analysis and Design of Soft Ground Tunnels,
PB82-134628 1213

SOIL STRUCTURE

Factor of Safety Charts for Estimating the Stability of Saturated and Unsaturated Tailings Pond Embankments.
PB82-135518 1167

SOIL STRUCTURE INTERACTIONS

Probabilistic Analysis of Seismic Response of Multi-Supported Structures on Soft Soils (Analisis Probabilistico de la Respuesta Sismica de Estructuras Sobre Varios Apoyos en Suelos Blandos),
PB82-135377 1226

SOILS

Terrain Analysis Procedural Guide for Soil. Report Number 6 in the ETL Series on Guides for Army Terrain Analysts.
AD-A107 048/1 1156

Site Characterization for the MBCE/DIRT II Battlefield Environment Tests.
AD-A107 338/6 1236

Simple Computer Program to Model 3-Dimensional Underground Heat Flow with Realistic Boundary Conditions.
DE81030213 1200

Hydrologic Study of the Unsaturated Zone Adjacent to a Radioactive-Waste Disposal Site at the Savannah River Plant, Aiken, South Carolina.
DE81031984 1159

Technology Assessment of Solar Energy Systems: Potential Soil Erosion Effects of Harvesting Crop Residues for Energy Production.
DE82000149 1181

Static Penetrometer for Soft and Loose Soils (Penetrometro Estatico Para Suelos Blandos Y Sueltos),

PB82-135401 1170

SOLAR ACTIVITY
Evolutionary Charts of Solar Activity (Calcium Plages) as Functions of Heliographic Longitude and Time 1964-1979.
PB82-130774 1083

SOLAR AIR CONDITIONING
Description and Performance of an Active Solar Cooling System, Using a LiBr-H2O Absorption Machine,
PB82-139031 1202

SOLAR ARRAYS
Voltage Gradients in Solar Array Cavities as Possible Breakdown Sites in Spacecraft-Charging-Induced Discharges.
N82-11107/1 1186

Solar Cell Development for the Power Extension Package.
N82-11551/0 1187

SOLAR CELLS
GaAs Shallow-Homojunction Solar Cells on Ge-Coated Si Substrates.
AD-A107 056/4 1184

Module Experimental Process System Development Unit (MEPSDU). Quarterly Report No. 3, June 1, 1981-August 31, 1981.
DE82000093 1186

Processing of Silicon Solar Cells by Ion Implantation and Laser Annealing.
N82-11546/0 1186

The Effects of Impurities on the Performance of Silicon Solar Cells.
N82-11548/6 1187

Solar Cell Development for the Power Extension Package.
N82-11551/0 1187

SOLAR COLLECTORS
Solar Energy Research at LASL. Progress Report, April 1-September 30, 1979.
LA-8283-PR 1201

Fracture Mechanics of Cellular Glass.
N82-11209/5 1189

Irrigation Market for Solar Thermal Parabolic Dish Systems.
N82-11549/4 1182

Secondary and Compound Concentrators for Parabolic Dish Solar Thermal Power Systems.
N82-11550/2 1182

Flat Plate Solar Collector Design and Performance. 1976-November, 1981 (Citations from the NTIS Data Base).
PB82-802729 1184

Solar Ponds. 1976-November, 1981 (Citations from the NTIS Data Base).
PB82-802869 1184

SOLAR CONSTANT
Radiation Balances and the Solar Constant.
N82-12016/3 1085

SOLAR COOLING SYSTEMS
Solar Total Energy: Large Scale Experimental at Shenandoah, Georgia. Phase III. Preliminary Design. Final Report, October 1, 1977-July 31, 1978.
ALO-3985-1 1181

Solar Energy Research at LASL. Progress Report, April 1-September 30, 1979.
LA-8283-PR 1201

Description and Performance of an Active Solar Cooling System, Using a LiBr-H2O Absorption Machine,
PB82-139031 1202

SOLAR ECLIPSES
Ionization and Aerosol Particulates in the Middle Atmosphere.
AD-A107 361/8 1084

SOLAR ENERGY
Industry Views on the Ability of the U.S. Photovoltaics Industry to Compete in Foreign Markets.
AD-A106 881/6 1097

Solar 79 Northwest.
CONF-790845-(Sup.) 1181

Integration of Solar Energy into Utility-System Planning and Strategies: 1980-2000.
DE81026923 1181

Strategic Analysis of Conservation and Solar Energy Policies.
DE82000252 1181

Solar Energy Research at LASL. Progress Report, April 1-September 30, 1979.
LA-8283-PR 1201

Utility Solar Finance: Economic and Institutional Analysis.
LBL-9959 1098

Irrigation Market for Solar Thermal Parabolic Dish Systems.
N82-11549/4 1182

Social Control of Energy: A Case for the Promise of Decentralized Solar Technologies.
ORAU/IEA-80-2(M) 1182

Solar Energy Modulator.
PAT-APPL-6-284 286 1183

SOLAR FLUX DENSITY
Solar Energy Modulator.
PAT-APPL-6-284 286 1183

SOLAR HEATING
Sputtered Films for Wavelength-Selective Applications.
AD-A107 232/1 1200

Selling the Solar Home '80: Market Findings for the Housing Industry.
PB82-144668 1116

SOLAR HEATING SYSTEMS
Solar Total Energy: Large Scale Experimental at Shenandoah, Georgia. Phase III. Preliminary Design. Final Report, October 1, 1977-July 31, 1978.
ALO-3985-1 1181

Modeling Solar-Energy Systems for Economic Optimization.
DE81030030 1181

Solar Energy Research at LASL. Progress Report, April 1-September 30, 1979.
LA-8283-PR 1201

Analysis and Simulation of Performance Data for Residential Solar Heating and Heat Pump System in Seattle, Washington. Final Report, Volume II.
MSNW-78-3035(V.2) 1201

Energy-Resource Requirements of a Solar-Heating System.
NP-1902600 1201

Intermediate Minimum Property Standards for Solar Heating and Domestic Hot Water Systems. Volume 5.
PB82-144692 1184

SOLAR INDUSTRY
Marketing and Market Acceptance Data From the Residential Solar Demonstration Program: 1980. Volume 1: Detailed Analysis.
PB82-144635 1184

Marketing and Market Acceptance Data From the Residential Solar Demonstration Program: 1980. Volume 2: Technical Appendix.
PB82-144643 1184

SOLAR PANELS
Accelerated Stress Testing of Solar Photovoltaic Modules.
AD-A107 378/2 1184

SOLAR PONDS
Overview of the US Program for Nonconvecting Solar Ponds.
LA-UR-80-2134 1181

Solar Ponds. 1976-November, 1981 (Citations from the NTIS Data Base).
PB82-802869 1184

SOLAR POSITION
Computation of Averaged Monthly Zonal Albedo Utilizing the Solar Zenith Angle, Properties of Clear and Cloudy Atmospheres.
N82-12010/6 1082

SOLAR PROCESS HEAT
Solar Total Energy: Large Scale Experimental at Shenandoah, Georgia. Phase III. Preliminary Design. Final Report, October 1, 1977-July 31, 1978.
ALO-3985-1 1181

Preliminary Definition and Characterization of a Solar Industrial Process Heat Technology and Manufacturing Plant for the Year 2000.
LA-8137-TASE 1182

Solar Industrial Process Heat Systems - An Assessment of Standards for Materials and Components,
PB82-133703 1202

SOLAR RADIATION
August 1981 Environmental Data for Sites in the National Solar Data Network.
DE82000071 1084

Computation of Averaged Monthly Zonal Albedo Utilizing the Solar Zenith Angle, Properties of Clear and Cloudy Atmospheres.
N82-12010/6 1082

Radiative Transfer in Cometary Dust Atmospheres: Critique of Recent Developments.
N82-12015/5 1083

Radiation Balances and the Solar Constant.
N82-12016/3 1085

Stochastic Sun: Understanding the Intermittent Resource.
ORAU/IEA-80-10(M) 1182

SOLAR RADIATION SHIELDING
High Temperature Glass Thermal Control Structure and Coating.
PAT-APPL-6-308 007 1190

SOLAR SIMULATORS
Terrestrial Solar Simulators for Photovoltaic and Combined Photovoltaic and Thermal Device Measurement and Evaluation.
PB82-130063 1229

SOLAR SPACE HEATING
Solar Energy for Livestock Production: Dairy, Swine, Poultry.
DE81014880 1200

SOLAR TERRESTRIAL INTERACTIONS
Geomagnetic Observations.
N82-11693/0 1085

SOLAR WATER HEATERS
Energy-Resource Requirements of a Solar-Heating System.
NP-1902600 1201

Multi-Family Solar Domestic Hot Water Analysis,
PB82-130139 1202

Installation Guidelines for Solar Domestic Hot Water (DHW) Systems in One- and Two-Family Dwellings. Second Edition.
PB82-144676 1202

SOLAR WATER HEATING
Solar Energy for Livestock Production: Dairy, Swine, Poultry.
DE81014880 1200

SOLAR WIND
Parametric Interaction and Spatial Collapse of Beam-Driven Langmuir Waves in the Solar Wind.
AD-A107 217/2 1082

SOLDIER CREEK BASIN
Selected Hydrologic Relationships for Soldier Creek, Northeastern Kansas.
PB82-138751 1160

SOLID CRYOGEN COOLING
Cooling by Conversion of Para to Ortho-Hydrogen.
PAT-APPL-6-301 075 1152

SOLID JET ENGINE FUELS
Modeling Solid-Fuel Ramjet Combustion Including Radiation Heat Transfer to the Fuel Surface.
AD-A107 441/8 1270

SOLID SOLUTIONS
Growth of Solid Solution Single Crystals.
N82-11958/7 1253

SOLID STATE ELECTRONICS
TRACALS Evaluation Report. Solid State Instrument Landing System AN/GRN-29(V) Initial Evaluation Report, Columbus AFB, Mississippi, 7-20 July 1981.
AD-A107 397/2 1237

SOLID WASTE DISPOSAL
Materials Recycling: An Overview of the Mineral Waste Utilization Symposium (6th).
PB82-133828 1213

Waste Processing and Pollution in the Chemical and Petrochemical Industries. 1978-June, 1980 (Citations from the NTIS Data Base).
PB82-802661 1147

Waste Processing and Pollution in the Chemical and Petrochemical Industries. July, 1980-November, 1981 (Citations from the NTIS Data Base).
PB82-802679 1147

Pollution Caused by Ammunition Manufacturing. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802737 1147

SOLID WASTES
Survey of On-Going and Completed Remedial Action Projects.
PB82-134115 1213

Heat Energy Recovery from Domestic Output Fluids (HERDOF),
PB82-134156 1188

SOLIDIFIED GASES
Cooling by Conversion of Para to Ortho-Hydrogen.
PAT-APPL-6-301 075 1152

SOLIDS
Advances in Sample Introduction for Elemental Analysis.
AD-A107 514/2 1150

SOLITARY WAVES
High Solitary Waves in Water: Results of Calculations,
AD-A107 267/7 1253

SOLITONS
Comparative Investigation of the Stability of One-Dimensional and Spherical Symmetric Solitons of the Scalar Field with Self-Interaction Jsub(Mu)Jsup(Mu).
JINR-R-2-12232 1261

Plasma Solitons. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
PB82-859745 1261

SOLUTIONS (MIXTURES)
Apparent Molal Volumes and Adiabatic Compressibilities of Aqueous Transition Metal Chlorides at 25 c.
AD-A107 222/2 1149

Adiabatic Partial Molal Compressibilities of Electrolytes in 0.725m NaCl Solutions at 25 c.
AD-A107 223/0 1149

SOLVENT EXTRACTION
Solvent Extraction Studies Using High-Molecular-Weight Amines.
DE81030061 1150

SOLVENTS
Chemicals Identified in Human Biological Media.
DE81030813 1141

SONAR SIGNALS
Source Ranging by a Single Array in a Multipath Ocean.
AD-A106 988/9 1232

SONAR SOUND ANALYZERS
Source Ranging by a Single Array in a Multipath Ocean.
AD-A106 988/9 1232

Underwater Target Tracking Using Measurements from a Linear Array of Omnidirectional Acoustic Elements.

AD-A107 070/5 1232

Sonar Image Processing. An Application of Template Matching through Relaxation.
AD-A107 281/8 1233

SORPTION
Linearization of the Water Sorption Isotherm for Homogeneous Ingredients Over aw 0.30 - 0.95.
AD-A107 160/4 1149

SORTING
Digital Signal Sorting for Digitized Speech in an Environment of Common Digital Data Signals.
AD-A107 266/9 1233

SOUND INTENSITY
Handbook for Industrial Noise Control.
N82-11858/9 1252

SOURCES
Minerals Critical to Developing Future Energy Technologies, Their Availability, and Projected Demand.
AD-A106 903/8 1180

SOUTH AFRICA
Standard Specification for Air-Brake Reservoirs.
N82-11464/6 1220

SOUTH ATLANTIC BIGHT
South Atlantic OCS Physical Oceanography, Year II. Volume III: Data Products, Part I.
PB82-141888 1156

South Atlantic OCS Physical Oceanography, Year II. Volume III: Data Products, Part II.
PB82-141896 1156

SOUTH CAROLINA
Socioeconomic Assessment of Defense Waste Processing Facility Impacts in the Savannah River Plant Region.
DE82000522 1244

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: South Carolina, Volume 40.
HRP-0903718/5 1127

Transportation of Radioactive Material in South Carolina.
NUREG/CR-2195 1243

SOUTH DAKOTA
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: South Dakota, Volume 41, Part 1.
HRP-0903719/3 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: South Dakota, Volume 41, Part 2.
HRP-0903720/1 1127

SOUTH KOREA
Terminal Forecast Reference Notebook, Osan AB, Korea.
AD-A107 433/5 1086

SOYBEANS
Seed-Protein Genes and the Regulation of Their Expression. Progress Report.
DE81030165 1120

Users Manual for the US Baseline Corn and Soybean Segment Classification Procedure.
N81-29504/0 1080

SOYUZ SPACECRAFT
Hungarian Cosmonaut in Space.
N82-11097/4 1272

SPACE COMMUNICATION
The Telecommunications and Data Acquisition Report.
N82-11279/8 1234

SPACE ENVIRONMENT SIMULATION
Evaluation of the Effects of Solar Radiation on Glasses.
N82-11207/9 1256

SPACE ENVIRONMENTS
Proton Upsets in LSI Memories in Space.
AD-A107 331/1 1173

SPACE ERECTABLE STRUCTURES
Technology for Large Space Systems: A Special Bibliography.
N82-11093/3 1272

Study of Foldable Elastic Tubes for Large Space Structure Applications, Phase 3.
N82-11493/5 1273

SPACE EXPLORATION
A Proposed New Policy for Planetary Protection.
N82-11095/8 1272

SPACE HEATING
Evaluation of Residential Building Energy-Performance Standards.
LBL-9816 1201

SPACE LAW
Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.
N82-11989/2 1103

SPACE POWER REACTORS
Reactor Technology. Progress Report, January-March 1980.
LA-8403-PR 1247

SPACE PROCESSING
Space Processing of Electronic Materials.
N82-11094/1 1222

SPACE PROCESSING APPLICATIONS ROCKET
SPAR Data Set Contents.
N82-11816/7 1273

SPACE SHUTTLE BOOSTERS
Space Shuttle Solid Rocket Booster Sting Interference Wind Tunnel Test Analysis.
N82-11040/4 1272

SPACE SHUTTLE MAIN ENGINE
Space Shuttle Main Engine Controller.
N82-11784/7 1273

SPACE SHUTTLE ORBITERS
The Effects of Lateral Aerodynamic Uncertainties on the Handling Qualities of the Space Shuttle Orbiter at Mach Numbers of 1.5 and .6.
N82-11051/1 1272

Dynamic Moire Methods for Detection of Loosened Space Shuttle Tiles.
N82-11434/9 1273

SPACE SHUTTLES
Wind Tunnel Tests of Elevon Gap Heating on the Space Shuttle Orbiter (OH-107).
AD-A107 287/5 1272

Shuttle Applications in Tropospheric Air Quality Observations.
N82-11635/1 1209

SPACE STORAGE
Analysis of Space Systems Study for the Space Disposal of Nuclear Waste Study Report. Volume 2: Technical Report.
N82-11889/4 1245

SPACE SYSTEMS
Structural Design of a Large Deformable Primary Mirror for a Space Telescope.
AD-A107 260/2 1256

SPACE-TIME
Gravitational Axial Superfield and the Formalism of Differential Geometry.
JINR-E-2-12511 1261

SPACECRAFT
The Effects of Lateral Aerodynamic Uncertainties on the Handling Qualities of the Space Shuttle Orbiter at Mach Numbers of 1.5 and .6.
N82-11051/1 1272

SPACECRAFT CHARGING
Testing of a Spacecraft Model in a Combined Environment Simulator.
N82-11106/3 1273

Voltage Gradients in Solar Array Cavities as Possible Breakdown Sites in Spacecraft-Charging-Induced Discharges.
N82-11107/1 1186

SPACECRAFT COMMUNICATION
ATS-5 12 Year in Orbit Evaluation.
N82-11101/4 1272

Telecommunications in Cometary Environments.
N82-11340/8 1234

Modulation/Demodulation Techniques for Satellite Communications. Part 4: Appendices.
N82-11341/6 1234

Satellite Receivers. 1975-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-858390 1235

SPACECRAFT CONSTRUCTION MATERIALS
Radiation Testing of Composite Materials, in Situ Versus Ex Situ Effects.
N82-11116/2 1190

SPACECRAFT MODELS
Testing of a Spacecraft Model in a Combined Environment Simulator.
N82-11106/3 1273

SPACECRAFT PERFORMANCE
ATS-5 12 Year in Orbit Evaluation.
N82-11101/4 1272

SPACECRAFT POWER SUPPLIES
Executive Summary: Brayton Isotope Power System.
DE81027473 1249

ATS-5 12 Year in Orbit Evaluation.
N82-11101/4 1272

Processing of Silicon Solar Cells by Ion Implantation and Laser Annealing.
N82-11546/0 1186

SPACECRAFT STRUCTURES
Technology for Large Space Systems: A Special Bibliography.
N82-11093/3 1272

SPACECRAFT TELEVISION
ATS-5 12 Year in Orbit Evaluation.
N82-11101/4 1272

SPACECRAFT TRACKING
The Telecommunications and Data Acquisition Report.
N82-11279/8 1234

SPANNING TREES (MATHEMATICS)
A Distributed Algorithm for Minimum Weight Directed Spanning Trees.
AD-A107 462/4 1173

SPANWISE BLOWING
A Study on Numerical Method for Evaluating Spanwise Integral in Subsonic Lifting-Surface Theory.
N82-11035/4 1076

SPARE PARTS
An Evaluation of Spares Acquistion Integrated with Production.
AD-A107 279/2 1231

SPARK CHAMBERS
Spark Chambers. 1970-1981 (Citations from the NTIS Data Base).
PB82-859869 1241

Spark Chambers. 1976-1981 (Citations from the Energy Data Base).
PB82-859885 1241

SPARK IGNITION ENGINES
Effects of Alcohol Fuels on Engine Wear.
AD-A107 136/4 1266

SPARKLE LAKE DAM
National Dam Safety Program. Sparkle Lake Dam (Inventory Number N.Y. 1330), Lower Hudson River Basin, Westchester County, New York. Phase I Inspection Report.
AD-A107 420/2 1208

SPATIAL DISTRIBUTION
The Multicategory Case of the Sequential Bayesian Pixel Selection and Estimation Procedure.
N81-29498/5 1198

Estimation of Proportions in Mixed Pixels Through Their Region Characterization.
N81-29510/7 1198

SPATIAL FILTERING
Evaluation of Spatial Filtering as a Means for Increasing Optical Performance in High Power Beam Trains.
AD-A107 164/6 1256

SPATIAL RESOLUTION
An Evaluation of the Spatial Resolution of Soil Moisture Information.
N82-11513/0 1170

SPECIALISTS
Avionic Communications and Avionic Navigation Systems Specialties AFS 328X0 and 328X1.
AD-A107 115/8 1107

SPECIALIZED TRAINING
Mines Safety Education and Training Seminar. Proceedings: Bureau of Mines Technology Transfer Seminars, Pittsburgh, PA., Dec. 9, 1980, Springfield, IL., Dec. 12, 1980, and Reno, NV., Dec. 16, 1980.
PB82-135450 1225

Work Simplification Training Techniques and Materials.
PB82-136458 1110

Crisis Intervention Training for Public Housing Residents and Staff: A Report on a Demonstration Program.
PB82-145004 1111

SPECIFICATIONS
Standard Specification for Light Ladders.
N82-11277/2 1218

SPECIMEN HANDLING
Pilot Program for the National Environmental Specimen Bank. Phase I.
PB82-133943 1132

SPECTRA
Depolarized Rayleigh Spectra of Siloxane Polymers.
AD-A107 161/2 1195

SPECTRAL BANDS
Development of MBE Grown Pb-Salt Semiconductor Lasers for the 8.0 to 15.0 Micrometer Spectral Region.
N82-11453/9 1255

SPECTRAL EMISSION
Far-Infrared Measurements of Trace Gases.
N82-11698/9 1228

SPECTRAL SENSITIVITY
An Analysis of Haze Effects on Landsat Multispectral Scanner Data.
N81-29497/7 1080

SPECTROSCOPY
Photon Correlation Spectroscopy of Bulk Siloxane Polymers.
AD-A107 153/9 1195

SPECTRUM ANALYSIS
Least Squares Autoregressive (Maximum Entropy) Spectral Estimation for Fourier Spectroscopy and Its Application to the Electron Cyclotron Emission from Plasma.
N82-11925/6 1261

SPECTRUM ANALYZERS
Interferometric Spectrum Analyzer.
AD-A107 015/0 1227

SPEECH RECOGNITION
Effect of Task Duration on Voice Recognition System Performance.
AD-A107 442/6 1104

Effect of Operator Mental Loading on Voice Recognition System Performance.
AD-A107 477/2 1234

SPEED REGULATORS
Compensation of the Speed Governor of a Water Turbine by the Method of Inequalities,
PB82-136011 1224

KEYWORD INDEX

SPENT FUEL ELEMENTS
Radiation Dose Rates from Commercial PWR and BWR Spent Fuel Elements.
DE82000697 1246

Fission Product Release. Progress Report, January 1-March 31, 1980.
LA-8389-PR 1249

Irradiated Fuel Inspection in a Storage Pond with No Fuel Movement and an Uncollimated Detector.
LA-8463-MS 1249

SPENT FUELS
Experimental Source Term Data Base for Assessing the Safety of Spent Fuel Transportation.
DE81023692 1243

Sensitivity Analysis of Transportation Parameters on Spent-Fuel-Cask Projections.
DE81025833 1243

SPENT SHALES
Investigation of Factors Affecting the in-Situ Combustion Retorting of Oil Shale. Final Report.
DE82000482 1161

Partitioning of Major, Minor, and Trace Elements During Simulated in-Situ Oil Shale Retorting.
LBL-9062 1151

Potential Uses of Spent Shale in the Treatment of Oil Shale Retort Waters.
LBL-11072 1209

SPERMATOGONIA
Spermatogonial Stem Cell Renewal Following Irradiation.
LBL-10109 1143

SPHERICAL SHELLS
On the Shape and Orientation Control of an Orbiting Shallow Spherical Shell Structure.
N82-11100/6 1272

SPIN WAVES
Low-Temperature Theories of the Classical One-Dimensional Easy-Plane Ferromagnet: Successes and Limitations.
PB82-131665 1263

Spin-Wave Damping in the Quantum Ising-Heisenberg Chain.
PB82-134149 1263

SPORES
Biochemistry of Bacterial Forespore Development and Spore Germination.
AD-A107 012/7 1141

SPRAYERS
The Water Spray Cooler - An Update.
PB82-135724 1167

SRC-II PROCESS
Solvent-Refined Coal (SRC) Process. Final Report.
DE81031937 1145

SRC PROCESS
Solvent-Refined Coal (SRC) Process. Final Report.
DE81031937 1145

Solvent Refined Coal Process: Operation of the Solvent Refined Coal Pilot Plant, Wilsonville, Alabama. First Quarter Report, January-March 1981.
DE82000420 1145

SRC-I Coal Refinery. Task 1, Appendix G. General Construction Specifications.
ORO-3054-T3(App.G) 1147

STAINLESS STEEL-304
Influence of Cyclic Load and Environmental Effects on Stress Corrosion Cracking of Sensitized Stainless Steel. Final Report.
DE81904216 1192

Seminar on Countermeasures for Pipe Cracking in BWRs.
DE82900055 1247

Erosion-Corrosion-Wear Program.
LBL-11109 1192

Calculation of Neutron and gamma Ray Energy Spectra for Fusion Reactor Shield Design: Comparison with Experiment.
ORNL/TM-7360 1240

STAINLESS STEEL-310
Erosion-Corrosion-Wear Program.
LBL-11109 1192

STAINLESS STEEL-316
Swelling and Microstructure of HFIR Irradiated Austenitic Stainless Steels.
DE82000158 1192

STAINLESS STEELS
Survey of Matrix Materials for Solidified Radioactive High-Level Waste.
DE82000708 1244

Erosion-Corrosion-Wear Program.
LBL-11109 1192

Fossil Energy Materials Needs Assessment.
ORNL/TM-7232 1193

STANDARD METROPOLITAN STATISTICAL AREAS
Development of Compatible State - SMSA Econometric Models.
PB82-133497 1099

Development of Compatible State - SMSA Econometric Models: Appendices.
PB82-133505 1099

STANDARD REFERENCE MATERIALS
The Direct Determination, by Differential Pulse Anodic-Stripping Voltammetry at the Thin Mercury-Film Electrode, of Cadmium, Lead, and Copper,
PB82-133125 1152

Standard Reference Data Publications, 1964-1980,
PB82-134362 1153

Standard Reference Materials: Summary of the Clinical Laboratory Standards Issued by the National Bureau of Standards.
PB82-135161 1153

NBS Standard Reference Materials Catalog, 1981-83 Edition.
PB82-138140 1153

The Certification of Polycyclic Aromatic Hydrocarbon Materials (PAH). Part II: The Six Methylchrysene Isomers (BRC Reference Materials No. 77, 78, 79, 80, 81 and 82).
PB82-138355 1153

STANDARDIZATION
Low-Cost Solar Array Project: Four Absolute Cavity Radiometer (Pyrheliometer) Intercomparisons at New River, Arizona: Radiometer Standards.
N82-11435/6 1228

Standardization in Microcomputer/LSI Products Via Electronic Information Exchange: JEDEC/EIES Project.
PB82-134735 1176

Consumer Representation in Standards Development: Literature Review and Issue Identification.
PB82-135880 1093

STANDARDS
Energy Impacted Area Development Assistance Program's Designation Criteria.
AD-A106 902/0 1180

Control of Air Pollution from Aviation: The Emission Standard Setting Process.
AD-A107 435/0 1208

Pesticide Registration Standard: Isopropalin.
PB82-131293 1136

Dialifor (O, O-diethyl S-(2-chloro-1-phthalimidoethyl) phosphorodithioate): Pesticide Registration Standard.
PB82-133638 1145

Naphthalene: Pesticide Registration Standard.
PB82-139437 1136

TEMEPHOS: O,O'-(thiodi-4,1-phenylene) bis(O,O-dimethyl phosphorothioate), Pesticide Registration Standard.
PB82-140641 1216

STARK EFFECT
An Analysis of Markovian Model Microfield Methods for Stark Broadening.
PB82-108044 1152

STARS
Relations among Stellar X-ray Emission Observed from Einstein, Stellar Rotation and Bolometric Luminosity.
PB82-133869 1083

STATE GOVERNMENT
State-Local Policy Management Project.
PB82-125907 1091

Strategies for State Participation in OCS Exploration Decisions: Onshore Facilities Related to Offshore Oil and Gas Development.
PB82-136482 1184

Future of State and Local Pensions.
PB82-144494 1111

State Tax Policy and Urban Economic Development,
PB82-144544 1216

STATE IMPLEMENTATION PLANS
Questions and Responses at the 1981 Workshops on Procedures to Demonstrate Attainment of the NAAQS (National Ambient Air Quality Standards) for Ozone in the 1982 SIPs (State Implementation Plans).
PB82-107863 1210

Permit Fee Guideline.
PB82-107871 1210

STATES (UNITED STATES)
State Laws Relating to the Ownership of U.S. Land by Aliens and Business Entities.
PB82-135211 1099

STATIONARY SOURCES
Compilation of Air Pollutant Emission Factors, Third Edition, Supplement 12.
PB82-107723 1210

STATISTICAL ANALYSIS
A Statistical Methodology for Constructing Synthetic Test Workloads.
AD-A107 257/8 1172

Statistical Research on Problems Associated with Navy Fire Protection and Fuel Technology Programs.
AD-A107 282/6 1225

A Comparison of Procedures for Constructing Large Item Pools.
AD-A107 364/2 1197

Applications of Non-Parametric Statistics and Analysis of Variance on Sample Variances.
N82-11834/0 1198

POLO2: A User's Guide to Multiple Probit or LOgit Analysis.
PB82-134487 1198

STATISTICAL DISTRIBUTIONS
Applications of Non-Parametric Statistics and Analysis of Variance on Sample Variances.
N82-11834/0 1198

STATISTICAL SAMPLES
A Comparison of Procedures for Constructing Large Item Pools.
AD-A107 364/2 1197

STATISTICAL TESTS
A Comparison of Procedures for Constructing Large Item Pools.
AD-A107 364/2 1197

STATISTICS
Fluctuation Properties of Multiplied-Poisson Light: Measurement of the Photon-Counting Distribution for Radioluminescence Radiation from Glass.
AD-A107 218/0 1256

NRCC Software Catalog. Volume 1.
LBL-10811 1174

STEAM GENERATORS
Steam Generator Chemical Cleaning: Demonstration Test No. 2 in a Pot Boiler.
DE81904251 1200

STEEL
Thresholds for Fatigue Initiation and Propagation and Plastic Work in HY80 and HY130 Steels.
AD-A106 946/7 1191

Dynamic J sub I-R Curve Testing of HY-130 Steel.
AD-A107 040/8 1191

Optimization of Performance of Arc Welding Using Fluxes in Welded Ship Structures from HY-100 and HY-130 KPSI.
AD-A107 341/0 1222

STEELS
Failure Analysis of a Tool Steel Torque Shaft.
N82-11184/0 1193

Sheet Metal Joining: Ferrous Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-858903 1223

Sheet Metal Joining: Ferrous Alloys. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
PB82-858911 1223

STELLAR TEMPERATURE
Theoretical Studies of Chromospheres and Winds in Cool Stars.
N82-12004/9 1082

STELLAR WINDS
Theoretical Studies of Chromospheres and Winds in Cool Stars.
N82-12004/9 1082

STELLITE 6
Thermophysical Properties of Selected Wear-Resistant Alloys.
HEDL-TME-79-6 1192

STENONEMA
A New Species of 'Stenonema' (Ephemeroptera: Heptageniidae) from Eastern North America.
PB82-132465 1121

STIFFNESS MATRIX
An Influence Coefficient Method for the Application of the Modal Technique to Wing Flutter Suppression of the Dast Arw-1 Wing.
N82-11070/1 1078

STIRLING CYCLE
Preliminary Study of Temperature Measurement Techniques for Stirling Engine Reciprocating Seals.
N82-11466/1 1271

Jet Impingement Heat Transfer Enhancement for the GPU-3 Stirling Engine.
N82-11993/4 1271

STIZOSTEDION VITREUM
Intensive Culture of Walleye ('Stizostedion vitreum vitreum'),
PB82-136391 1121

STOCHASTIC CONTROL
Theory and Applications of Optimal Control in Aerospace Systems,
AD-A106 937/6 1078

STOCHASTIC PROCESSES
Annual Progress Report.
AD-A106 983/0 1196

On the Optimal Solution of the One-Armed Bandit Adaptive Control Problem.
AD-A107 018/4 1196

Wartime Requirements for Ammunition Materiel and Personnel (WARRAMP). Volume I. Materiel Postprocessor User's Manual.
AD-A107 076/2 1232

Weak Compactness of Solution Measures Associated with Random Equations.
AD-A107 144/8 1197

STOCKS (FINANCE)
Initial Public Offerings of Common Stock: The Role of Regional Broker-Dealers in the Capital Formation Process: Phase I Report.

PB82-135997 1099

STORAGE BATTERIES
Lead Batteries. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802760 1188

STORAGE STABILITY
Technical and Economic Aspects of Hydrogen Storage in Metal Hydrides.
N82-11223/6 1268

The Storage of Hydrogen in the Form of Metal Hydrides: An Application to Thermal Engines.
N82-11225/1 1269

STORES
Military Contractor-Operated Stores' Contracts are Unmanageable and Vulnerable to Abuse.
AD-A107 499/6 1231

STORM SEWERS
Surface Drainage Design for Airfields and Heliports in Arctic and Subarctic Regions.
AD-A107 293/3 1205

STORMS
An Evaluation of the Spatial Resolution of Soil Moisture Information.
N82-11513/0 1170

STOVES
Saving Half of California's Energy and Peak Power in Buildings and Appliances Via Long-Range Standards and Other Legislation.
LBL-6865 1182

Solid-Fuel Cooking Stoves: Bibliography.
NP-1902593 1201

STRAIN (MECHANICS)
Localized Necking: An Inclined Imperfection Model.
AD-A107 137/2 1191

Fields near a Rapidly Propagating Crack-Tip in an Elastic Perfectly-Plastic Material.
AD-A107 350/1 1195

STRANGE PARTICLES
Strange-Particle Cross Sections from Four-Prong pi exp - p Interactions at 16 GeV/C.
JINR-E-1-12345 1258

STRAPS
Standard Specification for Industrial Safety-Belt Assemblies.
N82-11278/0 1225

STRATEGIC MATERIALS
Status of Strategic Petroleum Reserve Activities--July 1981.
AD-A106 923/6 1266

Status of Strategic Petroleum Reserve Activities--October 1980.
AD-A107 196/8 1266

Status of Strategic Petroleum Reserve Activities.
AD-A107 373/3 1266

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PB82-137266 1193

STRATEGIC PETROLEUM RESERVE
Analysis and Leak Tests of Wells for New Solution Mined Caverns at the Bryan Mound DOE-SPR Storage Site.
DE82000244 1267

STRATIFICATION
The Multicategory Case of the Sequential Bayesian Pixel Selection and Estimation Procedure.
N81-29498/5 1198

Users Manual for the US Baseline Corn and Soybean Segment Classification Procedure.
N81-29504/0 1080

STRATIGRAPHY
Pacific Pleistocene Paleoclimatic Stratigraphies: A Comparative Analysis of Results.
AD-A107 025/9 1168

Geologic Considerations in Underground Coal Mining System Design.
N82-11516/3 1166

STRATOSPHERE
Meridional Heat Transport at the Onset of Winter Stratospheric Warming.
N82-11697/1 1085

STREAM FLOW
User's Guide to the Physical Habitat Simulation System (PHABSIM).
PB82-134222 1160

Mean Annual Streamflow of Selected Drainage Basins in the Coal Area of Southeastern Montana.
PB82-137696 1160

Selected Hydrologic Relationships for Soldier Creek, Northeastern Kansas.
PB82-138751 1160

Colorado River Simulation System: An Executive Summary.
PB82-139387 1161

STRESS ANALYSIS
Finite Element Techniques for Static Stress and Free Vibration Analysis of Sandwich Composites.
AD-A107 095/2 1226

New Molding Method of Three-Dimensional Hollow Photoelastic Model and Centrifugal Stress Analysis of Air Cooled Turbine Blade Model.
N82-11067/7 1270

STRESS CORROSION
Seminar on Countermeasures for Pipe Cracking in BWRs.
DE82900055 1247

Fracture Mechanics of Cellular Glass.
N82-11209/5 1189

STRESS CORROSION CRACKING
Flaw Growth of 7075, 7475, 7050 and 7049 Aluminum Alloy Plate in Stress Corrosion Environments: 4-Year Marine Atmosphere Results.
N82-11181/6 1192

STRESS (PHYSIOLOGY)
When the Grand Tour's a Grind,
AD-A106 818/8 1143

Prediction of Energy Expenditure during Load Carriage at High Altitude.
AD-A106 652/7 1143

Nutrition Research--USSR,
AD-A107 335/2 1137

Effects of Hyperthermia and Radiation. 1978-1981 (Citations from the Energy Data Base).
PB82-859968 1135

STRESS (PSYCHOLOGY)
When the Grand Tour's a Grind,
AD-A106 818/8 1143

Nutrition Research--USSR,
AD-A107 335/2 1137

Family Roles in Transition. In a Changing Military.
AD-A107 348/5 1113

STRESS TESTING
Dynamic J sub I-R Curve Testing of HY-130 Steel.
AD-A107 040/8 1191

STRESSES
Magnetomechanical Acoustic Emission--A New Method for Non-Destructive Stress Measurement.
AD-A107 228/9 1228

Review of Current Capabilities for the Measurement of Stress, Displacement, and in Situ Deformation Modulus.
ONWI-95 1158

STRIP MINING
An Assessment of Wetland Habitat Establishment at a Central Florida Phosphate Mine Site.
PB82-130808 1211

STRONG-COUPLING MODEL
Investigation of the Problem of Massive Particle Capture by Quantum Scalar Field. Determination of the Effective Mass of the System.
JINR-R-2-12470 1259

STRUCTURAL ANALYSIS
The Dynamic Design-Analysis Method (DDAM) in NASTRAN.
AD-A107 074/7 1262

Structural Design of a Large Deformable Primary Mirror for a Space Telescope.
AD-A107 260/2 1256

Automatic Input Data Generation for ADINA and NASTRAN Structural Computer Codes.
AD-A107 534/0 1262

Parameter Estimation of Large Flexible Aerospace Structures with Application to the Control of the Maypole Deployable Reflector.
N82-11099/0 1272

Integrated Analysis of Engine.
N82-11491/9 1078

SPAR Data Set Contents.
N82-11816/7 1273

STRUCTURAL ENGINEERING
Research in Nonlinear Structural and Solid Mechanics.
N82-11489/3 1262

STRUCTURAL INFLUENCE COEFFICIENTS
An Influence Coefficient Method for the Application of the Modal Technique to Wing Flutter Suppression of the Dast Arw-1 Wing.
N82-11070/1 1078

STRUCTURAL RELIABILITY
Standard Specification for Light Ladders.
N82-11277/2 1218

STRUCTURAL STABILITY
An Influence Coefficient Method for the Application of the Modal Technique to Wing Flutter Suppression of the Dast Arw-1 Wing.
N82-11070/1 1078

STRUCTURAL VIBRATION
New Estimation Method for Flutter or Divergence Boundary from Random Responses at Subcritical Speeds.
N82-11034/7 1077

STRUCTURAL WEIGHT
Firefighting Module Development.
N82-11311/9 1225

STRUCTURE EDITORS
The Automatic Generation of Syntax Directed Editors.
AD-A107 078/8 1171

STRUCTURED PROGRAMMING
Programming Support Library (PSL). Users Manual.
AD-A107 249/5 1172

Programming Support Library (PSL). Technical Report.
AD-A107 250/3 1172

Programming Support Library (PSL). Operations Manual.
AD-A107 251/1 1172

Programming Support Library (PSL). Maintenance Manual. Volume I.
AD-A107 252/9 1172

Programming Support Library (PSL). Maintenance Manual. Volume II.
AD-A107 253/7 1172

COBOL Structured Code Analyzer.
PB82-121880 1175

Project RMAG: SLANG (Structured Language) Compiler,
PB82-127267 1175

STRUCTURES
A Study of the Interactions between Large-Scale Coherent Structures and Fine-Grained Turbulence in a Round Jet.
AD-A106 993/9 1253

Interactions between Large-Scale Coherent Structures and Fine-Grained Turbulence in Free Shear Flows.
AD-A107 210/7 1253

Design Criteria for Avalanche Control Structures in the Runout Zone.
PB82-108093 1169

Probabilistic Analysis of Seismic Response of Multi-Supported Structures on Soft Soils (Analisis Probabilistico de la Respuesta Sismica de Estructuras Sobre Varios Apoyos en Suelos Blandos),
PB82-135377 1226

STUDENTS
The Guaranteed Student Loan Information System Needs a Thorough Redesign to Account for the Expenditure of Billions.
AD-A106 875/8 1088

SUBBITUMINOUS COAL
Coal Combustion in High Convective Flows. Progress Report, March 1, 1981-August 31, 1981.
DE81030391 1265

SUBJECT INDEXING
The Subject Access Problem - Opportunities for Solution: A Workshop Held at Springfield, Virginia on 18-20 October, 1978.
PB82-134529 1096

SUBSONIC FLOW
Aeroacoustic Theory for Noncompact Wing-Gust Interaction.
N82-11071/9 1078

SUBSTITUTION REACTIONS
Vibrational Spectra of Oxygen- and Boron-Isotopically Substituted B2O3 Glasses.
AD-A107 333/7 1189

SUBSURFACE INVESTIGATIONS
Kielder Aqueduct Tunnels - Predicted and Actual Geology.
PB82-135302 1214

Site Investigation and Construction of the Cardiff Cable Tunnel,
PB82-135336 1214

SUCTION
Amplified Crossflow Disturbances in the Laminar Boundary Layer on Swept Wings with Suction.
N82-11391/1 1078

SUGAR BEETS
Evaporation by Mechanical Vapor Recompression. Technical Progress Report, April 1, 1980-June 30, 1980.
BSDF-38-3Q-80 1137

SULFATES
Experimental Work Related to Two Bismuth Sulfate Cycles and Their Possible Improvement. Outline of a Possible Antimonyl Sulfate Cycle with Separate Evolution of Sulfur Dioxide and Oxygen.
DE81030236 1267

SULFIDE MINERALS
Flotation Separation of Metallic Sulfide Particles. 1966-1981 (Citations from the Metals Abstracts Data Base).
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SULFIDIZATION
High Temperature Sulfidation of Cobalt and Cobalt Alloys. 1970-1981 (Citations from the NTIS Data Base).
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High Temperature Sulfidation of Iron and Iron Alloys. 1976-1981 (Citations from the Energy Data Base).
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SULFUR
Neutron-Capture gamma-Ray Analysis of Coal for Sulfur, Iron, Silicon and Moisture.
IS-T-847 1165

SUPERCALCINE
Durability of Simulated Supercalcine Ceramics at Geologic Storage Conditions.
NUREG/CR-2418 1245

SUPERCONDUCTING CABLES
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LA-8446-PR 1263

SUPERCONDUCTING COILS
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LA-7885-MS(V.2) 1188

1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix B: Cost Study, High-Purity Aluminum Production.
LA-7885-MS(V.3) 1188

1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix D: Superconductive Magnetic Energy Storage Cavern Construction Methods and Costs.
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SUPERCONDUCTING MAGNETS
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SUPERCONDUCTORS
Active Superconductive Generator Development 400-Horsepower Generator Design.
AD-A107 513/4 1185

SUPERCRITICAL WINGS
A Comparison of Theoretical and Experimental Pressure Distributions for Two Advanced Fighter Wings.
N82-11054/5 1078

SUPERGIANT STARS
Density Sensitive C II Lines in Cool Stars of Low Gravity.
PB82-133885 1083

SUPERGRAVITY
Gravitational Axial Superfield and the Formalism of Differential Geometry.
JINR-E-2-12511 1261

Quantization of the Axial Current for the Massless Rarita-Schwinger Field.
NORDITA-78-19 1261

SUPERSATURATION
Degassing Supersaturated Water for Fish Culture,
PB82-136623 1121

SUPERSONIC FLOW
A Method of Determining the Turbulent Base Pressure in Uniform and Non-Uniform Supersonic Axisymmetric Flows.
AD-A107 318/8 1076

Steady/Oscillatory, Supersonic/Hypersonic Inviscid Flow Past Oscillating Wings and Wedge Combinations at Arbitrary Angles of Attack.
AD-A107 438/4 1076

SUPERVISION
The Comptroller of the Currency Should Decide the Extent to Which His Action Control System is Needed.
AD-A107 182/8 1097

SUPPORT INTERFERENCE
Space Shuttle Solid Rocket Booster Sting Interference Wind Tunnel Test Analysis.
N82-11040/4 1272

SUPPRESSORS
Design and Fabrication of Coanda Suppressor Flow Visualization Model,
AD-A107 436/8 1270

SURETY BONDS
SBA's Progress in Implementing the Public Law 95-507 Subcontracting and Surety Bond Waiver Provisions Has Been Limited.
PB82-133844 1092

SURFACE ACOUSTIC WAVE DEVICES
The Effect of Acoustic Dispersion and Attenuation on SAW Convolver Performance.
AD-A107 057/2 1178

Electromagnetic Long-Line Effects in Surface Wave Convolvers.
AD-A107 060/6 1252

Surface Acoustic Wave Microwave Oscillator and Frequency Synthesizer.
AD-A107 539/9 1178

SURFACE AIR
Annual Environmental Monitoring Report of the Lawrence Berkeley Laboratory, 1979.
LBL-11192 1246

SURFACE BARRIER DETECTORS
Beta-Gauge Methods Applied to Aerosol Samples.
LBL-9128 1241

SURFACE CHEMISTRY
Electrostatic Binding of Electroactive and Non-Electroactive Anions in a Surface-Confined, Electroactive Polymer: Selectivity of Binding Measured by Auger Spectroscopy and Cyclic Voltammetry.
AD-A106 928/5 1148

Laser-Stimulated Molecular Dynamics and Rate Processes.
AD-A107 246/1 1149

Energy and Tangential Momentum Accommodation on Different Flashed Tungsten and Gas Covered Tungsten Surfaces.
AD-A107 495/4 1149

The Adsorption of NO on Ni (111): An ESDIAD/LEED Study.
PB82-137373 1153

SURFACE COATINGS
Protective Coatings for Pipelines. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-858564 1190

SURFACE EFFECT SHIPS
Surface Effect Vehicles/Ships in Marine Environments. 1970-November, 1981 (Citations from the Engineering Index Data Base).
PB82-802844 1224

SURFACE ENERGY
Universal Binding Energy Relations in Metallic Adhesion.
N82-11183/2 1189

SURFACE FINISHING
Recommendations for Road Surface Dressing.
PB82-132630 1219

Surface Dressing in Developing Countries: Research in Kenya,
PB82-135351 1220

SURFACE LAYERS
Method of Neutralizing the Corrosive Surface of Amine-Cured Epoxy Resins.
PAT-APPL-6-293 412 1195

SURFACE MINING
Coal Mine Labor Productivity: Mine-Level Data from Pike County, Kentucky, and Other Selected Counties.
ORAU-168 1166

Coal Surface Mining Reclamation and Fish and Wildlife Relationships in the Easten United States. Volume I: Past Findings, the Surface Mining Law of 1977 (P.L. 95-87), Planning and Management Considerations, and Information Sources.
PB82-130816 1211

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PB82-130824 1211

SURFACE NAVIGATION
The Worldwide Navigational Warning Service,
AD-A107 372/5 1234

SURFACE PROPERTIES
Analysis of Solid Surfaces. June, 1976-1981 (Citations from the Energy Data Base).
PB82-859265 1154

SURFACE REACTIONS
Universal Binding Energy Relations in Metallic Adhesion.
N82-11183/2 1189

SURFACE ROUGHNESS
The Wear of Polymers Sliding on Polymeric Films Deposited on Rough Surfaces.
AD-A107 158/8 1195

SURFACE TEMPERATURE
Preliminary Study of Temperature Measurement Techniques for Stirling Engine Reciprocating Seals.
N82-11466/1 1271

SURFACE TO AIR MISSILES
Scale Modeling for the PATRIOT Electromagnetic Pulse Test.
AD-A107 480/6 1232

Missile Safety Qualification of Short Range Air Defense (SHORAD) Missiles.
AD-A107 505/0 1232

Process for Fragment Layup, Filler Application, and Outer Coating for PATRIOT GM Warhead M248.
AD-A107 536/5 1232

SURFACE TO SURFACE MISSILES
China's Ballistic Missile Plans--Translation.
AD-A107 426/9 1232

SURFACE WATERS
Utilization of Geothermal Energy in the Mining and Processing of Tungsten Ore. 2ND Quarterly Report.
DOE/ET/27232-T4 1162

Annual Environmental Monitoring Report of the Lawrence Berkeley Laboratory, 1979.
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PB82-129305 1160

Water Resources Data for Indiana, Water Year 1980.
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PB82-136110 1160

Water Resources Data for Florida. Volume 4: Northwest Florida.
PB82-136128 1160

SURFACES
Surface and Defect Excitations in Covalently Bonded Solids.
AD-A107 064/8 1263

A Study on Numerical Method for Evaluating Spanwise Integral in Subsonic Lifting-Surface Theory.
N82-11035/4 1076

SURGERY
Verdict on Vagotomy.
AD-A106 959/0 1122

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AD-A107 093/7 1123

SURGICAL IMPLANTATION
Evaluation of the Parietal Bones in the Rat as a Specific Site for the Testing of Osteogenic Materials. A Simple Animal Model to Study Bone Implant Material.
AD-A107 036/6 1123

SURVEYING (GEOGRAPHIC)
Fast, Accurate Two-Person Beach Surveys.
AD-A107 285/9 1157

SURVEYS
Airborne Communication Systems Career Ladder, AFSC 294X0.
AD-A107 472/3 1109

Fuels Career Ladder AFSC 631X0.
AD-A107 473/1 1109

Annual Housing Survey 1978. United States and Regions. Housing Characteristics of Recent Movers.
PB82-144460 1116

SURVIVABILITY
Survivability--The Effort and the Payoff.
AD-A107 108/3 1230

SUSQUEHANNA RIVER
Oxygen Dynamics Study - Susquehanna River Below Conowingo Dam, Maryland: Volume I.
PB82-135971 1136

SWEPT WINGS
Amplified Crossflow Disturbances in the Laminar Boundary Layer on Swept Wings with Suction.
N82-11391/1 1078

SWEPTBACK WINGS
Selected Articles--Translation.
AD-A107 322/0 1077

SWITCHING CIRCUITS
Active Lamp Pulse Driver Circuit.
PAT-APPL-6-276 748 1179

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PB82-859828 1179

SYCOL PROGRAMMING LANGUAGE
SYCOL: Informal Language Specification,
PB82-135658 1176

SYCOL: A High Level Language for Applications in Real Time Control Systems,
PB82-135666 1176

SYMBOLS
Standardization of Map Symbology for Large Scale Maps.
AD-A107 448/3 1156

SYMPOSIA
Verdict on Vagotomy.
AD-A106 959/0 1122

Proceedings of the Thirteenth Symposium on Naval Hydrodynamics Held at Tokyo (Japan) on October 6-10 1980,
AD-A106 987/1 1224

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AD-A107 106/7 1181

Food in the Future: Proceedings of a Planning Symposium.
AD-A107 145/5 1079

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AD-A107 302/2 1123

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AD-A107 336/0 1120

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AD-A107 357/6 1143

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AD-A107 437/6 1109

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AD-A107 464/0 1197

9th Scientific Meeting of the International Epidemiological Association.
AD-A107 471/5 1124

SYNCHRONOUS MOTORS
Application of a Rare-Earth Cobalt Magnet to Synchronous Motors.
N82-11358/0 1171

SYNCHRONOUS SATELLITES
Mission Operation Report: Rca-D/delta Launch.

N82-11102/2 1273

SYNERGISTIC EFFECTS
Effects of Hyperthermia and Radiation. 1978-1981 (Citations from the Energy Data Base).
PB82-859968 1135

SYNOPTIC METEOROLOGY
Topographically Induced Diurnal Boundary Layer Oscillations: Two Dimensional Synoptic Scale Modeling.
AD-A107 199/2 1086

A Two-Dimensional Finite Element Advection Model with Variable Resolution.
AD-A107 511/8 1086

SYNTAX
The Automatic Generation of Syntax Directed Editors.
AD-A107 078/8 1171

An Application of Syntactic Pattern Recognition to Seismic Discrimination,
AD-A107 383/2 1238

SYNTHESIS (CHEMISTRY)
Synthesis, Radiation Degradation, and Electron Beam Resist Behavior of Fluorine-Containing Vinyl Polymers.
AD-A106 913/7 1194

Chemistry of Aryloxazolines. Applications to the Synthesis of Lignan Lactone Derivatives.
AD-A107 224/8 1147

Soliton Formation and cis trans Isomerization in Polyacetylene.
AD-A107 274/3 1195

Determination of Sample Container Effects on Wearmetals Concentration in MIL-L-7808 Synthetic Lubricant Analyzed on an A/E35U-3 Fluid Analysis Spectrometer.
AD-A107 323/8 1194

Preparation of Large-Diameter GaAs Crystals.
AD-A107 395/6 1252

Pentamethylcyclopentadienyl Cobaltaboranes Derived from the B5H8(-) and B9H14(-) Ions: Studies in Synthesis and Structure.
AD-A107 457/4 1147

Synthesis of Energetic Polymers.
AD-A107 498/8 1147

SYNTHETIC APERTURE RADAR
SAR Processing on the MPP.
N82-11801/9 1174

Synthetic Aperture Radar Target Simulator.
PAT-APPL-6-284 287 1238

SYNTHETIC FUELS
Unresolved Issues Resulting from Changes in DOE's Synthetic Fuels Commercialization Programs.
AD-A106 883/2 1266

Synthetic Fuels Corporation's Management of Demonstration Projects Would Be Limited.
AD-A106 920/2 1266

Fractionation of Diesel Fuel from Petroleum and Paraho Shale Oils.
AD-A107 042/4 1266

The United States Synthetic Fuels Corporation's Project Selection Guidelines Need Clarification.
AD-A107 184/4 1266

Effects of Synfuel Use.
PB82-132432 1212

SYSTEMS ANALYSIS
Diagnostic and Condition Monitoring System Assessment for Army Helicopter Modular Turboshaft Engines.
AD-A107 315/4 1270

SYSTEMS ENGINEERING
Geologic Considerations in Underground Coal Mining System Design.
N82-11516/3 1166

Space Shuttle Main Engine Controller.
N82-11784/7 1273

Comparisons of Some Large Scientific Computers.
N82-11817/5 1174

SYSTEMS IDENTIFICATION
Recursive System Identification Using Fast Algorithms,
PB82-134578 1198

T-38 AIRCRAFT
SEL and EPNL Noise Duration Coefficients for the 747 and T-38 Aircraft.
N82-11860/5 1078

TACFIRE SYSTEM
Utilization of Tactical Computers for Training: Analysis of System and Training Requirements.
AD-A107 531/6 1109

TACTICAL AIRCRAFT
Aviation Materiel Combat Ready In-Country (AMCRIC).
AD-A107 451/7 1231

TACTICAL COMMUNICATIONS
Guidelines for Managing the Flow of Information in an Automated Battlefield Command and Control System.
AD-A107 297/4 1233

TACTICAL DATA SYSTEMS
Evaluation of the Army's Advanced Field Artillery Tactical Data System.
AD-A106 897/2 1251

Guidelines for Managing the Flow of Information in an Automated Battlefield Command and Control System.
AD-A107 297/4 1233

Utilization of Tactical Computers for Training: Field Evaluation Plan.
AD-A107 316/2 1108

Guideline Development for Summarization of Tactical Data.
AD-A107 329/5 1234

Application of Tactical Data Systems for Training. Volume IV. Development of Courseware and Analysis of Results for GED Math.
AD-A107 530/8 1109

Utilization of Tactical Computers for Training: Analysis of System and Training Requirements.
AD-A107 531/6 1109

Development of Data Processing Strategies for Potential Application in the Tactical Operations Systems (TOS) and Other Tactical Data Systems.
AD-A107 532/4 1232

TACTICAL WARFARE
Training Improvements for the Tactical Aircrew Training System (TACTS): Project Summary Report.
AD-A107 003/6 1107

TAFFS (THE ARMY FUNCTIONAL FIRE SYSTEM)
Records Filing, Maintenance and Disposition Study for Department of the Army.
AD-A107 079/6 1094

TAILINGS
Factor of Safety Charts for Estimating the Stability of Saturated and Unsaturated Tailings Pond Embankments.
PB82-135518 1167

TAILORED TESTING
The Use of the Sequential Probability Ratio Test in Making Grade Classifications in Conjunction with Tailored Testing.
AD-A107 367/5 1112

TANGENTIALLY BLOWN WINGS
A Study of Wall Jets and Tangentially Blown Wings.
AD-A106 986/3 1077

TANTALUM
Thermodynamics of the Tantalum-Carbon-Chlorine-Hydrogen System Applied to the CVD of Carbide/Carbon Composite Materials.
LA-UR-80-1252 1190

The 4f(13)5f Configuration in the Isoelectronic Sequence of Yb iii.
PB82-137407 1153

TANTALUM CARBIDES
Thermodynamics of the Tantalum-Carbon-Chlorine-Hydrogen System Applied to the CVD of Carbide/Carbon Composite Materials.
LA-UR-80-1252 1190

TARGET ACQUISITION
Target Information Processing: The Effects on Reaction Time of Terrain, Downlook Angle, and Response Processing Level.
AD-A107 295/8 1111

Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236

TARGET CLASSIFICATION
Design and Utilization of an Infrared Data Base for an Advanced Image Interpretation Facility.
AD-A107 529/0 1173

TARGET DETECTION
Experimental Investigation of Near Real-Time Interpretation Techniques for Transmitted Imagery.
AD-A107 515/9 1103

TARGET RECOGNITION
Target Information Processing: The Effects on Reaction Time of Terrain, Downlook Angle, and Response Processing Level.
AD-A107 295/8 1111

Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236

Experimental Investigation of Near Real-Time Interpretation Techniques for Transmitted Imagery.
AD-A107 515/9 1103

TARGET SIMULATORS
Synthetic Aperture Radar Target Simulator.
PAT-APPL-6-284 287 1238

TARGETS
Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236

TAXES
Billions of Dollars are Involved in Taxation of the Life Insurance Industry -- Some Corrections in the Law are Needed.
AD-A106 856/8 1097

Special Estate Tax Provisions for Farmers Should be Simplified to Achieve Fair Distribution of Benefits.
AD-A106 857/6 1102

TAXICABS
Taxicab Transportation. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802497 1217

TAXIWAYS
Alert Aircraft Roll Over Chocks.
AD-A107 456/6 1079

TEACHING METHODS
Initial Skill Training for Navy Enlisted Personnel.
AD-A107 177/8 1107

TECHNICAL ASSISTANCE
Riverport and Transportation Plan for the City of Madison Port Authority, Madison, Indiana. Final Preliminary Plan (Revised).
PB82-131541 1211

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PB82-134255 1099

TECHNICAL REPORTS
A Systematic Management Approach Is Needed for Congressional Reporting Requirements.
PB82-137753 1096

TECHNOLOGY
Soviet Science and Technology Policy--Translation.
JPRS-79119 1228

TECHNOLOGY ASSESSMENT
Multiple Perspective Concept with Applications to Technology Assessment and Other Decision Areas.
PB82-128604 1091

The Multiple Perspective Concept with Applications to Technology Assessment and Other Decision Areas (Condensed Version),
PB82-128612 1091

TECHNOLOGY INNOVATION
Technological Innovation and Problem-Solving in Local Government: An Assessment of Current Research Methods.
PB82-128620 1091

Technological Innovation and Problem-Solving in Local Government: An Assessment of Current Research Methods, Executive Summary.
PB82-128638 1091

The Effects of Future Information Processing Technology on the Federal Government ADP Situation.
PB82-138181 1177

TECHNOLOGY TRANSFER
Software Technology Transfer and Export Control.
AD-A106 869/1 1097

U.S. Technology Transfer to the Soviet Union: A Dilemma.
AD-A107 313/9 1090

Enhancing Technology Transfer of Computer Hardware and Software Architectures Using Human Factors in Initial Design.
AD-A107 444/2 1104

The Critical Technologies Project Executive Summary.
AD-A107 489/7 1097

Twenty-Five Innovations from Abroad.
PB82-138322 1093

TELECOMMUNICATION
Telecommunications in Cometary Environments.
N82-11340/8 1234

The Federal Side of Traditional Telecommunications Cost Allocations,
PB82-128976 1234

The States Regulate Cable: A Legislative Analysis of Substantive Provisions,
PB82-128984 1234

Taxation, Regionalization and Pole Attachments: A Comparison of State Cable Television Policies,
PB82-128992 1234

The Regulation of Cable Television Subscriber Rates by State Commissions,
PB82-129008 1234

The Economic Impact of State Cable TV Regulation,
PB82-129016 1235

Federal Preemption of State Regulation in Cable Television,
PB82-129024 1235

Chronology of Cable Television Regulation: 1947 - 1978,
PB82-129032 1235

The Role of Communications and Information Resources in Canada,
PB82-129057 1235

Revenue and Cost Allocations: Policy Means and Ends in the Railroad and Telecommunications Industries,
PB82-129065 1098

Compunications Network Management,
PB82-129081 1235

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TELECOMMUNICATIONS
Legislative and Regulatory Actions Needed to Deal with a Changing Domestic Telecommunications Industry.
AD-A106 835/2 1102

TELEMETER SYSTEMS
A 10.6 micrometer Amplitude Modulated Telemeter Laser with Nonlinear Postdetection: Study of a Single Laser System--Translation.
AD-A107 475/6 1256

TELEMETRY
Magnetic Field Satellite (MAGSAT) Data Processing System Specifications.
N82-11103/0 1174

TELEPHONE EQUIPMENT
Common Carrier Land Mobile Base Stations Cumulative Staff Study Listing.
PB82-915200 1236

TELERADIOLOGY
Teleradiology.
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TELEVISION BROADCASTING
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PB82-858390 1235

TELEVISION SYSTEMS
Teleradiology.
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TEMPERATURE
Investigation of Release Temperatures for Kinzua Dam, Allegheny River, Pennsylvania. Hybrid Model Investigation.
AD-A106 974/9 1204

Acclimation Temperature: An Important Factor Influencing the Interaction of Chlorine, delta T and Exposure Duration to Eggs, Prolarvae and Larvae of Striped Bass, 'Morone saxatilis',
PB82-116894 1145

TEMPERATURE MEASUREMENT
Preliminary Study of Temperature Measurement Techniques for Stirling Engine Reciprocating Seals.
N82-11466/1 1271

TENNESSEE
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HRP-0903713/6 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Tennessee, Volume 42, Part 2.
HRP-0903714/4 1127

TENSILE PROPERTIES
Tensile Tests on Articulated Concrete Mattress Specimens.
AD-A107 422/8 1218

Radiation Testing of Composite Materials, in Situ Versus Ex Situ Effects.
N82-11116/2 1190

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Radiation Testing of Composite Materials, in Situ Versus Ex Situ Effects.
N82-11116/2 1190

TENSORS
Mixing of a Passive Scalar in Isotropic and Sheared Homogeneous Turbulence.
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TERRESTRIAL PLANETS
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N82-11691/4 1158

TERRESTRIAL RADIATION
Time-Variable Earth's Albedo Model Characteristics and Applications to Satellite Sampling Errors.
N82-11723/5 1085

Thermal Algorithms Analysis.
N82-11800/1 1174

Radiation Balances and the Solar Constant.
N82-12016/3 1085

TERRORISM
Terrorism; A Bibliography of Books and Periodical Articles.
AD-A107 291/7 1232

TEST CONSTRUCTION (PSYCHOLOGY)
Procedures for Criterion Referenced Tailored Testing.
AD-A107 135/6 1111

The Use of the Sequential Probability Ratio Test in Making Grade Classifications in Conjunction with Tailored Testing.
AD-A107 367/5 1112

TEST EQUIPMENT
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TEST FACILITIES
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AD-A106 890/7 1269

Microwave Irradiation and Instrumental Behavior in Rats: Unitized Irradiation and Behavioral Evaluation Facility.
AD-A107 023/4 1143

Lewis Research Center's Coal-Fired, Pressurized, Fluidized-Bed Reactor Test Facility.
N82-11397/8 1265

Acoustic Model Power Distribution in a Duct at High Frequencies.
PB82-139064 1229

TEST METHODS
Estimation of the Homogenization Temperature of a 1.2 Polybutadiene/1.4 Polybutadiene Diblock Copolymer Using Rheological Testing Methods.
AD-A107 069/7 1194

Procedures for Criterion Referenced Tailored Testing.
AD-A107 135/6 1111

Tensile Tests on Articulated Concrete Mattress Specimens.
AD-A107 422/8 1218

Missile Safety Qualification of Short Range Air Defense (SHORAD) Missiles.
AD-A107 505/0 1232

Evaluation of Tests for Determining the Pumpability of Concrete Mixtures.
AD-A107 524/1 1218

TETHERED BALLOONS
Tethered Balloon Sampling Systems for Monitoring Air Pollution.
PB82-126319 1210

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N82-11695/5 1169

TEXT EDITING SYSTEMS
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INFO: The JHU/APL Information Package Manual.
PB82-121757 1174

TEXT PROCESSING
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THAILAND
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THANATOLOGY
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THEOREM PROVING
Deductive Synthesis of the Unification Algorithm,
AD-A107 328/7 1173

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THERMAL CONDUCTIVITY
Space Processing of Electronic Materials.
N82-11094/1 1222

Thermal Conductivity of a Concrete Mortar from 95 K to 320 K.
PB82-134370 1220

A Transient Hot Wire Thermal Conductivity Apparatus for Fluids,
PB82-140609 1229

THERMAL CONTROL COATINGS
High Temperature Glass Thermal Control Structure and Coating.
PAT-APPL-6-308 007 1190

THERMAL INSULATION
High Temperature Thermal Insulation Usage in UK Process Industries.
NP-1902598 1201

High Temperature Glass Thermal Control Structure and Coating.
PAT-APPL-6-308 007 1190

THERMAL POLLUTION
Investigation of Hydrodynamic and Behavioral Factors That Affect Zooplankton Sampling by Pumps.
PB82-137886 1122

THERMAL UTILIZATION
Questions Concerning DOE's Assignment of Operating and Testing Responsibilities for OTEC-1.
AD-A106 860/0 1179

THERMAL WELLS
Feasibility of the Connection of Wells in Hot Dry Rocks by Means of Hydraulic Fracturing Techniques: Experimental Research Dealing with Three-Dimensional Crack Interaction, Largely Utilizing Photoelastic Techniques.
PB82-140138 1167

THERMISTORS
A True Air Speed Sensor for Miniature Unmanned Aircraft.
AD-A106 967/3 1079

THERMOCHEMISTRY
Chemisorption and Thermal Chemistry of Azulene and Naphthalene Adsorbed on Pt(lll).
AD-A107 068/9 1148

Time-Resolved Infrared Study of Bimolecular Reactions between Tert-Butly Radicals.
AD-A107 154/7 1148

THERMODYNAMIC EFFICIENCY
Evaluation of the Micro-Carburetor.
N82-11994/2 1271

THERMODYNAMIC PROPERTIES
Silicon Carbide as an Oxidation-Resistant High-Temperature Material. 1: Oxidation and Heat Corrosion Behavior.
N82-11120/4 1189

THERMODYNAMICS
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THERMOELECTRIC GENERATORS
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Thermoelectric Generator Testing and RTG Degradation Mechanisms Evaluation. Progress Report No. 37.
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Thermoelectric Generator Testing and RTG Degradation Mechanisms Evaluation. Progress Report No. 36.
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User's Manual for Factor-Jump Thermogravimetry Apparatus, and Associated Programs, Including a General Plotting Program,
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The Fracture of Thermosetting Resins after Exposure to Water.
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THIN FILMS
Intrinsic Stress in Thin Films Deposited on Anisotropic Substrates and its Influence on the Natural Frequencies of Piezoelectric Resonators.
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Effects of a Thin SiO2 Layer on the Formation of Metal-Silicon Contacts.
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THIOSEMICARBAZONES
2-Acetylpyridine Thiosemicarbazones. 3. Selenium Analogs as Potential Antimalarial Agents.
AD-A106 958/2 1141

THIRD PARTY PAYERS
Physicians and Financial Incentives,
PB82-133695 1132

THORIUM
Selective Two-Step Titration of Thorium by Sulfate Displacement of the Diethylenetriaminepentaacetic Acid Complex.
LA-8349 1151

Metallurgical and Mechanical Properties of Thorium-Doped Ir-0.3% W Alloys.
ORNL-5616 1193

THORIUM CARBIDES
Dissolution of HTGR TRISO Beads by the Alkali Fluoride Fusion Method.
NBL-296 1249

THREE DIMENSIONAL FLOW
Aeroacoustic Theory for Noncompact Wing-Gust Interaction.
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THREE MILE ISLAND-2 REACTOR
Fuel Damage Estimates for the TMI-2 Reactor.
LA-UR-80-1069 1248

THROMBIN
Participation of the Hypophyseal-Adrenal Cortex System in Thrombin Clearance During Immobilization Stress.
N82-11760/7 1144

THULIUM 169 TARGET
Evaluation of the Capture Cross Section of exp 169 Tm from 10 exp -5 EV to 2.10 exp 7 EV.
CEA-CONF-4469 1257

TIDAL CURRENTS
Circulation and Trajectory Calculations in the Eastern Strait of Juan de Fuca Using a CODAR System,
PB82-134099 1156

TILES
Dynamic Moire Methods for Detection of Loosened Space Shuttle Tiles.
N82-11434/9 1273

TIMBER IDENTIFICATION
Nationwide Forestry Applications Program. Analysis of Forest Classification Accuracy.
N81-29499/3 1081

TIME
SEL and EPNL Noise Duration Coefficients for the 747 and T-38 Aircraft.
N82-11860/5 1078

TIME SERIES ANALYSIS
Final Scientific Report.
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Spectral Estimation Technology.
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IRIG-TIME Synchronized Binary Video Data Inserter.
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Tensile Properties and Microstructure of Helium-Injected and Reactor-Irradiated V-20 Ti.
DE81032005 1192

TMX DEVICES
Ambipolar Potential Formation and Control in Bumpy Tori and Mirrors.
DE81030636 1239

TOKAMAK DEVICES
Boosting Up of Neutral Beam Heating Power by Slowly Rising Toroidal Field.
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PB82-107210 1139

TOLUENES
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AD-A106 943/4 1154

TOLUMIDES
Primary Dermal Irritation Potential of the Insect Repellent CHF1 and Its Components.
AD-A106 944/2 1144

TOMOGRAPHY
Tomographic Reconstruction of Strongly Refracting Fields and Its Application to Interferometric Measurement of Boundary Layers.
AD-A106 823/8 1229

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TOPOGRAPHY
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N82-11516/3 1166

TORAK
Dialifor (O, O-diethyl S-(2-chloro-1-phthalimidoethyl) phosphorodithioate): Pesticide Registration Standard.
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TORQUE
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AD-A107 324/6 1142

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AD-A107 276/8 1135

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AD-A107 346/9 1144

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AD-A107 381/6 1144

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AD-A107 382/4 1144

TOXICOLOGY

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PB82-118894 1145

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PB82-127960 1210

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PB82-128117 1136

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TRAILERS

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PB82-144619 1136

TRAILING EDGES

Aircraft Wing Trailing-Edge Noise.
N82-11039/6 1076

Helicopter Rotor Trailing Edge Noise.
N82-11859/7 1078

TRAINING

Controller Staffing and Training at Four FAA Air Traffic Control Facilities.
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TRANQUILIZER DRUGS

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Fewer Agent Transfers Should Benefit the FBI and Its Agents as Well as Save Money.
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TRANSFORMATIONS (MATHEMATICS)

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AD-A107 490/5 1236

TRANSFORMERS

Symposium on Power and Measurement Transformers.
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TRANSISTOR AMPLIFIERS

A 31-GHz Monolithic GaAs Mixer/Preamplifier Circuit for Receiver Applications.
AD-A107 062/2 1178

Integrated Balanced FETs for Broadband Millimeter Wave Amplifiers.
AD-A107 526/6 1171

TRANSITION METALS

The Volume and Compressbility Change for the Formation of Transition Metal Sulfate Ion Pairs at 25 C.
AD-A107 149/7 1148

Apparent Molal Volumes and Adiabatic Compressibilities of Aqueous Transition Metal Chlorides at 25 c.
AD-A107 222/2 1149

TRANSITIONS

Minerals Critical to Developing Future Energy Technologies, Their Availability, and Projected Demand.
AD-A106 903/8 1180

TRANSLATOR ROUTINES

COBOL Analysis and Translate System (CATS).
PB82-121773 1174

COBOL Analysis and Translate System (CATS). Technical Note.
PB82-121781 1175

TRANSLATORS

Communications Intelligence: Transcriber Output Enhancement.
AD-A107 296/6 1103

TRANSLOCATION (GENETICS)

Case of Hereditary (4;5) Translocation Discovered Prenatally,
PB82-129693 1131

TRANSMISSION LINES

Automatic Microwave Network Analyzer Calibration by Reference to a Transmission-Line Standard with Applications to Characterization of Adapters, Devices, and Coaxial Lines with SMA Connectors.
AD-A107 198/4 1227

TRANSMISSION LOSS

Electromagnetic Long-Line Effects in Surface Wave Convolvers.
AD-A107 060/6 1252

TRANSONIC FLOW

A Study of Wall Jets and Tangentially Blown Wings.
AD-A106 986/3 1077

Prediction of Aerodynamic Forces on a Circular Cylinder and a Thin Airfoil in a Transonic Airstream by the Finite Element Method.
AD-A107 201/6 1076

Calculations of Transonic Potential Flow over Cascades.
N82-11041/2 1270

A Comparison of Theoretical and Experimental Pressure Distributions for Two Advanced Fighter Wings.
N82-11054/5 1078

TRANSPIRATION

Descriptive and Sensitivity Analyses of Watbali: A Dynamic Soil Water Model.
N81-29507/3 1170

TRANSPORT PROPERTIES

Charge Instabilities in Lateral Super-Lattices under Conditions of Population Inversion.
AD-A106 911/1 1262

Hot-Carrier Microwave Conductivity in the Non-Zero Collision Duration Regime.
AD-A107 120/8 1263

Conceptual Problems in Modeling Submicron Device Physics.
AD-A107 159/6 1171

Theory of Drift Instabilities and the Associated Anomalous Transport.
N82-11924/9 1240

TRANSPORTATION

Transportation of Radioactive Material in South Carolina.
NUREG/CR-2195 1243

Department of Transportation Awards to Academic Institutions in Fiscal Year 1980,
PB82-141508 1216

TRANSPORTATION CORRIDORS

Traffic Diversion Software Applications Summary.
PB82-131673 1212

TRANSPORTATION SYSTEMS

Worldwide Transportation/Energy Demand, 1975-2000. Revised Variflex Model Projections.
ORNL/Sub-79/45740/1 1183

TRAPPING (CHARGED PARTICLES)

Trap Studies on GaAs-Si3N4 Interfaces.
AD-A106 990/5 1263

Application of the Semicontinuum Potential Model to Deduce Localized Electron Trapping Sites in Single Crystals of D-Sorbitol.
AD-A107 156/2 1149

TRAVEL

Management of the Department of State Office of Passport Services Needs to be Improved.
AD-A106 880/8 1088

Determining Optimum Routes from Maps,
PB82-135310 1214

Trial of a Computer Generated Travel Information System in Two British Rail Travel Enquiry Bureaux,
PB82-135781 1096

Tourism and Vacation Travel: State and Local Government Planning. 1964-November, 1981 (Citations from the NTIS Data Base).
PB82-802505 1120

TREATMENT

The Community Mental Health Project: Pilot Project.
PB82-135252 1132

TREES (MATHEMATICS)

On the Expressive Power of Dynamic Logic. II,
AD-A107 430/1 1197

A Distributed Algorithm for Minimum Weight Directed Spanning Trees.
AD-A107 462/4 1173

TREXLER LAKE

Trexler Lake Project, Lehigh River Basin, PA. Supplement.
AD-A107 087/9 1204

TRIACS

Triode AC Semiconductor Switch Circuits. 1974-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-859828 1179

TRIBALOY 700

Thermophysical Properties of Selected Wear-Resistant Alloys.
HEDL-TME-79-6 1192

TRIBALOY 800

Thermophysical Properties of Selected Wear-Resistant Alloys.
HEDL-TME-79-6 1192

TRIBOLOGY

Universal Binding Energy Relations in Metallic Adhesion.
N82-11183/2 1189

TRICHLOROETHYLENE

Evaluation of Gamma Radiation for Destruction of Pentachlorophenol in Aqueous Solution and on Activated Carbon.
AD-A106 943/4 1154

TRIMETHYL COMPOUNDS

The Stability of New Transparent Polymeric Materials: The Epoxy Trimethoxyboroxine System. Part 1: The Preparation, Characterization and Curing of Epoxy Resins and Their Copolymers.
N82-11208/7 1195

TRITIUM TARGET

Exp 3 H(p,N) exp 3 He Differential Cross Sections Below 5 MeV and the n- exp 3 He Cross Sections.
LA-8215-MS 1259

TROPICAL CYCLONES

A Numerical Study of the Role of Air-Sea Fluxes in Extratropical Cyclogenesis.
AD-A107 508/4 1086

TROPOSPHERE

Shuttle Applications in Tropospheric Air Quality Observations.
N82-11635/1 1209

TROPOSPHERIC SCATTER COMMUNICATIONS

Application of Digital Troposcatter to the DCS.
AD-A107 303/0 1234

TROUT

Corps of Engineers' Acquisition of Fish Hatchery Proves Costly.
AD-A106 828/7 1079

Monitoring Calcium in Trout Eggs Exposed to Hydrazine.
AD-A107 138/0 1144

TRUCKING INDUSTRY

Potential Fuel Conservation from Regulatory Reform of the Trucking Industry.
PB82-130907 1183

TRUCKS
Directory of Information for Dynamometer Testing of 1979-1981 Light Duty Motor Vehicles,
PB82-106873 1221

TRUSSES
Study of Foldable Elastic Tubes for Large Space Structure Applications, Phase 3.
N82-11493/5 1273

TRYPANOSOMA
Trypanosoma congolense: Natural and Acquired Resistance in the Bovine.
AD-A106 952/5 1122

Trypanosoma rhodesiense: Chemical and Immunological Characterization of Variant-Specific Surface Coat Glycoproteins.
AD-A106 961/6 1123

TRYPANOSOMA CONGOLENSE
Trypanosoma congolense: Natural and Acquired Resistance in the Bovine.
AD-A106 952/5 1122

TRYPANOSOMA RHODESIENSE
Trypanosoma rhodesiense: Chemical and Immunological Characterization of Variant-Specific Surface Coat Glycoproteins.
AD-A106 961/6 1123

TUBE CATHODES
Nitrogen Sensitivities of a Sample of Commercial Hot Cathode Ionization Gage Tubes.
PB82-133877 1152

TUBE JOINTS
Geometrical Non-Linearity in Collapse Analysis of Thick Shells, with Application to Tubular Steel Joints,
PB82-132929 1219

TUMOR PROMOTERS
Study of Protein Modifications Induced by Phorbol Ester Tumor Promoters in Mouse Skin.
DE81031985 1145

TUNGSTEN
Energy and Tangential Momentum Accommodation on Different Flashed Tungsten and Gas Covered Tungsten Surfaces.
AD-A107 495/4 1149

Utilization of Geothermal Energy in the Mining and Processing of Tungsten Ore. 2ND Quarterly Report.
DOE/ET/27232-T4 1162

The 4f(13)5f Configuration in the Isoelectronic Sequence of Yb III.
PB82-137407 1153

TUNGSTEN ALLOYS
Model for the Elongation of Boron on Tungsten during Chemical Vapor Deposition.
AD-A106 989/7 1191

Metallurgical and Mechanical Properties of Thorium-Doped Ir-0.3% W Alloys.
ORNL-5816 1193

TUNGSTEN CONTAINING ALLOYS
Alloying Effects of Tungsten. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-858572 1193

TUNING
Tuned Analog Network.
PAT-APPL-6-301 077 1179

TUNISIA
Risk and Allocative Errors Due to Imperfect Information: The Impact on Wheat Technology in Tunisia.
PB82-134552 1080

TUNNEL CONSTRUCTION
Tunnel Construction. August, 1979-June, 1980 (Citations from the Engineering Index Data Base).
PB82-802877 1218

Tunnel Construction. July, 1980-November, 1981 (Citations from the Engineering Index Data Base).
PB82-802885 1218

Tunnel Construction. 1977-November, 1981 (Citations from the NTIS Data Base).
PB82-802893 1218

TUNNEL SUPPORTS
Tunnel Construction. August, 1979-June, 1980 (Citations from the Engineering Index Data Base).
PB82-802877 1218

Tunnel Construction. July, 1980-November, 1981 (Citations from the Engineering Index Data Base).
PB82-802885 1218

Tunnel Construction. 1977-November, 1981 (Citations from the NTIS Data Base).
PB82-802893 1218

TUNNELING (EXCAVATION)
Tunnel Construction. August, 1979-June, 1980 (Citations from the Engineering Index Data Base).
PB82-802877 1218

Tunnel Construction. July, 1980-November, 1981 (Citations from the Engineering Index Data Base).
PB82-802885 1218

Tunnel Construction. 1977-November, 1981 (Citations from the NTIS Data Base).
PB82-802893 1218

TUNNELS
A Review of Numerical Methods for the Analysis and Design of Soft Ground Tunnels,
PB82-134628 1213

Site Investigation and Construction of the Cardiff Cable Tunnel,
PB82-135336 1214

TURBINE BLADES
Analytical and Experimental Study of Flow Phenomena in Noncavitating Rocket Pump Inducers.
N82-11031/3 1270

New Molding Method of Three-Dimensional Hollow Photoelastic Model and Centrifugal Stress Analysis of Air Cooled Turbine Blade Model.
N82-11067/7 1270

Trends in High Temperature Gas Turbine Materials.
N82-11182/4 1193

TURBINE PUMPS
Analytical and Experimental Study of Flow Phenomena in Noncavitating Rocket Pump Inducers.
N82-11031/3 1270

Firefighting Module Development.
N82-11311/9 1225

Advanced Superposition Methods for High Speed Turbopump Vibration Analysis.
N82-11465/3 1225

Liquid Oxygen Turbopump Technology.
N82-11468/7 1225

TURBINES
A Two-Dimensional Study of the Maximum Power That Can Be Obtained from a Wind Turbine in a Wind Shear Layer.
PB82-136987 1187

TURBOFAN ENGINES
An Analytical and Experimental Analysis of Factors Affecting Exhaust System Performance in Sea Level Static Jet Engine Test Facilities.
AD-A106 890/7 1269

TURBOGENERATORS
Lewis Research Center's Coal-Fired, Pressurized, Fluidized-Bed Reactor Test Facility.
N82-11397/8 1265

TURBOJET ENGINES
An Analytical and Experimental Analysis of Factors Affecting Exhaust System Performance in Sea Level Static Jet Engine Test Facilities.
AD-A106 890/7 1269

TURBOSHAFT ENGINES
Diagnostic and Condition Monitoring System Assessment for Army Helicopter Modular Turboshaft Engines.
AD-A107 315/4 1270

TURBULENCE
A Wake Source Model for Asymmetric Potential Flow past Bodies of Wedge Shape.
N82-11036/2 1254

TURBULENT BOUNDARY LAYER
Atmospheric Turbulence as a Function of Height above Various Surface Materials.
AD-A107 034/1 1085

TURBULENT FLOW
A Study of the Interactions between Large-Scale Coherent Structures and Fine-Grained Turbulence in a Round Jet.
AD-A106 993/9 1253

Interactions between Large-Scale Coherent Structures and Fine-Grained Turbulence in Free Shear Flows.
AD-A107 210/7 1253

A Method of Determining the Turbulent Base Pressure in Uniform and Non-Uniform Supersonic Axisymmetric Flows.
AD-A107 318/8 1076

Wind-Tunnel Results for a Modified 17-Percent-Thick Low-Speed Airfoil Section.
N82-11033/9 1076

A Three-Dimensional Simulation of Transition and Early Turbulence in a Time-Developing Mixing Layer.
N82-11393/7 1254

Mixing of a Passive Scalar in Isotropic and Sheared Homogeneous Turbulence.
N82-11394/5 1254

Higher-Level Simulations of Turbulent Flows.
N82-11395/2 1254

Numerical Simulation of a Compressible Homogeneous, Turbulent Shear Flow.
N82-11396/0 1254

TURBULENT MIXING
A Three-Dimensional Simulation of Transition and Early Turbulence in a Time-Developing Mixing Layer.
N82-11393/7 1254

Mixing of a Passive Scalar in Isotropic and Sheared Homogeneous Turbulence.
N82-11394/5 1254

TURNING (MANEUVERING)
Aids to Navigation Principal Findings on the CAORF Experiment. The Performance of Visual Aids to Navigation as Evaluated by Simulation.
AD-A107 045/7 1236

TWO DIMENSIONAL
A Two-Dimensional Finite Element Advection Model with Variable Resolution.
AD-A107 511/8 1086

TWO DIMENSIONAL FLOW
Some Observations on a New Numerical Method for Solving Navier-Stokes Equations.
N82-11032/1 1254

A Wake Source Model for Non-Symmetric Flow past Bluff Bodies in Two-Dimensional Flow.
N82-11037/0 1076

U-GAS PROCESS
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FE-2582-13 1146

U.S.S.R. SPACE PROGRAM
Hungarian Cosmonaut in Space.
N82-11097/4 1272

ULTRASONIC NEBULIZERS
Inductively Coupled Plasma-Atomic Emission Spectrometric Analysis of Environmental Samples Using Ultrasonic Nebulization.
PB82-118209 1229

ULTRASONIC RADIATION
Optical Fiber Interferometer for the Study of Ultrasonic Waves in Composite Materials.
N82-11121/2 1191

ULTRASONIC TESTS
Digital Ultrasonics Signal Processing: Flaw Data Post Processing Use and Description.
N82-11862/1 1228

ULTRASONIC WAVE TRANSDUCERS
Optical Fiber Interferometer for the Study of Ultrasonic Waves in Composite Materials.
N82-11121/2 1191

ULTRAVIOLET LASERS
Ultraviolet Lasers. 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859059 1256

Ultraviolet Lasers. 1976-1981 (Citations from the Energy Data Base).
PB82-859067 1256

UNDERGROUND DISPOSAL
The Dutch Geologic Radioactive Waste Disposal Project.
PB82-138397 1245

UNDERGROUND MINING
Coal Mine Labor Productivity: Mine-Level Data from Pike County, Kentucky, and Other Selected Counties.
ORAU-168 1166

UNDERGROUND STORAGE
1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix D: Superconductive Magnetic Energy Storage Cavern Construction Methods and Costs.
LA-7885-MS(V.5) 1188

UNDERWATER NAVIGATION
Sonar Image Processing. An Application of Template Matching through Relaxation.
AD-A107 281/8 1233

UNDERWATER TRACKING
Underwater Target Tracking Using Measurements from a Linear Array of Omnidirectional Acoustic Elements.
AD-A107 070/5 1232

UNDERWATER VEHICLES
Sonar Image Processing. An Application of Template Matching through Relaxation.
AD-A107 281/8 1233

UNDERWEAR
Effectiveness of Five Water-Cooled Undergarments in Reducing Heat Stress of Vehicle Crewmen Operating in a Hot Wet or Hot Dry Environment.
AD-A107 105/9 1143

UNEMPLOYMENT INSURANCE
Using CWBH Data to Evaluate the Methods Used in the Urban Institute's Simulation Model of Unemployment Insurance Benefits.
PB82-134206 1110

UNIFORM FLOW
Generation of Axi-Symmetric Body Shapes in Subsonic Flow by Means of Polynomial Distributions of Sources and Doublets Along the Axis of Symmetry.
N82-11038/8 1254

UNITED STATES
The United States Remains Unprepared for Oil Import Disruptions. Volume I. Summary: Includes Conclusions and Recommendations.
AD-A106 921/0 1180

The United States Remains Unprepared for Oil Import Disruptions. Volume II. Detailed Review of Current Emergency Programs and Alternative Approaches.
AD-A106 922/8 1180

Interpersonal Relations Among Hispanics in the United States: A Content Analysis of the Social Science Literature.
AD-A107 460/8 1113

Annual Housing Survey: 1978. United States and Regions. Part A: General Housing Characteristics.
PB82-144882 1118

Annual Housing Survey: 1978. United States and Regions. Part C: Financial Characteristics of the Housing Inventory.
PB82-144890 1119

UNITED STATES GOVERNMENT

Legislative and Regulatory Actions Needed to Deal with a Changing Domestic Telecommunications Industry.
AD-A106 835/2 1102

Unresolved Issues Resulting from Changes in DOE's Synthetic Fuels Commercialization Programs.
AD-A106 883/2 1266

Analysis of Federal Funding for Electric Utility R&D Projects.
AD-A106 888/1 1088

Report of the President's Task Force on Aircraft Crew Complement,
AD-A106 889/9 1106

Options for Establishing an Energy Conservation Consolidated Grant Program.
AD-A106 919/4 1180

Status Report on Implementation of GAO's Audit Findings and Recommendations.
AD-A107 376/6 1090

UNITED STATES MILITARY ACADEMY

Characteristics of the Class of 1985,
AD-A107 100/0 1107

UNIVERSITIES

Consortium for Public Administration Field Services: The First Two Years.
PB82-144700 1093

URANIUM

Applications of DHDECMP Extraction Chromatography to Nuclear Analytical Chemistry.
DE81030134 1150

Infrared and Structural Analyses of Uranium Oxidation Products: Preliminary Results.
DE82000233 1151

Partial Thermal Denitration of Uranyl Nitrate Solutions in a Screw Denitrator.
ORNL/TM-6264 1249

URANIUM 233

Experimental Criticality Specifications, Update Through 1979. Informal Report.
LA-7170-MS-Sup.) 1249

URANIUM 235

Experimental Criticality Specifications, Update Through 1979. Informal Report.
LA-7170-MS-Sup.) 1249

URANIUM 235 TARGET

Comparison of the ENDF/B-V and SOKRATOR Evaluations of exp 235 U, exp 239 Pu, exp 240 Pu and exp 241 Pu at Low Neutron Energies.
DE81032037 1258

URANIUM CARBIDES

Dissolution of HTGR TRISO Beads by the Alkali Fluoride Fusion Method.
NBL-296 1249

URANIUM DEPOSITS

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Harrison Bay Quadrangle, Alaska. Final Report, Volume 1.
DE82000338 1161

Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Arizona--New Mexico, Mesa Quadrangle.
GJBX-23(79)(V.2-A) 1163

Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Arizona--New Mexico, Clifton Quadrangle.
GJBX-23(79)(V.2-B) 1163

Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Arizona--New Mexico, Tucson Quadrangle.
GJBX-23(79)(V.2-C) 1163

Nure Aerial gamma-Ray and Magnetic Reconnaissance Survey: Colorado-Arizona Area, Grand Canyon NJ 12-10 Quadrangle.
GJBX-35(80)(V.2) 1163

Aerial Radiometric and Magnetic Survey: Seguin National Topographic Map, Texas Gulf Coast.
GJBX-37(79)(V.1) 1163

Aerial Radiometric and Magnetic Survey: Seguin National Topographic Map, Texas Gulf Coast.
GJBX-37(79)(V.2) 1163

Study of Airborne gamma-Ray Spectrometer Data Procedures: Wind River Basin, Wyoming, Casper Quadrangle.
GJBX-40(79)(V.2-A) 1163

Study of Airborne gamma-Ray Spectrometer Data Procedures: Wind River Basin, Wyoming, Arminto Quadrangle.
GJBX-40(79)(V.2-B) 1163

Study of Airborne gamma-Ray Spectrometer Data Procedures: Wind River Basin, Wyoming, Thermopolis Quadrangle.
GJBX-40(79)(V.2-D) 1163

Aerial Radiometric and Magnetic Reconnaissance Survey of South-Central Colorado Trinidad Quadrangle.
GJBX-59(80)(V.2) 1164

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GJBX-71(80)(V.2)(OGDEN) 1164

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GJBX-73(80)(V.1) 1164

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Medfra Quadrangle (Alaska). Final Report.
GJBX-76(80)(V.1) 1164

Airborne gamma-Ray Spectrometer and Magnetometer Survey: McGrath Quadrangle (Alaska). Final Report.
GJBX-77(80)(V.1) 1164

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Ophir Quadrangle (Alaska). Final Report.
GJBX-78(80)(V.1) 1164

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Sleetmute Quadrangle (Alaska). Final Report.
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GJBX-92(80)(V.2A) 1165

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GJBX-92(80)(V.2E) 1165

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GJBX-92(80)(V.2F) 1165

Aerial Radiometric and Magnetic Survey: Corpus Christi/Laredo National Topographic Map, Texas Gulf Coast.
GJBX-99(79)(V.2) 1165

NURE Aerial gamma-Ray and Magnetic Reconnaissance Survey. Cook Inlet Alaska Area: Tyonek Quadrangle.
GJBX-108(78)(V.1)(TYEK) 1162

NURE Aerial gamma-Ray and Magnetic Reconnaissance Survey. Cook Inlet Alaska Area: Anchorage Quadrangle.
GJBX-108(78)(V.2)(ANGE) 1162

Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Springfield Quadrangle of Missouri. Final Report.
GJBX-149(80) 1162

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GJBX-150(80) 1162

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GJBX-153(80) 1163

Aerial gamma Ray Amd Magnetic Survey: Mississippi and Florida Survey, Meridian Quadrangle of Mississippi and Alabama. Final Report.
GJBX-154(80) 1163

Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Hattiesburg Quadrangle of Mississippi, Alabama, and Louisiana. Final Report.
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URANIUM DIOXIDE

Infrared and Structural Analyses of Uranium Oxidation Products: Preliminary Results.
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Nuclear Materials Research Progress Reports for 1979.
LBL-11030 1249

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IAEA-R-1145-F(1978) 1165

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URANIUM OXIDES

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URBAN AREAS

Aerosol Formation in Urban Plumes.
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A Survey of Citizen Views and Concerns About Urban Life.
PB82-141250 1115

Relevance to HUD of Recent Scholarly Research in Urban Economics,
PB82-144452 1101

Northeast Municipal Economic Development. A National League of Cities Study of Municipal Economic Development Needs, Capacities and Perceptions In the Northeast.
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Risk of Inner-City Mortgage Lending,
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URBAN DEVELOPMENT

State Tax Policy and Urban Economic Development,
PB82-144544 1216

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URBAN PLANNING

Analysis of HUD's May 4, 1981 Response Concerning Its Efforts to Alleviate Housing Abandonment.
AD-A106 832/9 1203

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PB82-137027 1114

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DE82000706 1138

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DOE/RA/11025-T1(V.1) 1186

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LASL-80-10(BRIEF) 1182

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ORNL/TM-8626/V1 1187

USER CHARGES

Methods for Allocating Highway Costs.
PB82-130501 1211

USER MANUALS (COMPUTER PROGRAMS)

Conversion of Spu-Universal Disk File to Jsc-Universal Tape Storage: Convrt User's Guide.
N81-29501/6 1174

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USER MANUALS (COMPUTER SYSTEMS)

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USER NEEDS

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UTAH

Meteorological and Climatological Investigation: Review of January-June 1980 Investigative Period.
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UTILIZATION REVIEW

Design of an Evaluation of PSRO Long-Term Care Review.
PB82-131616 1132

V/STOL AIRCRAFT

Low Speed Testing of the Inlets Designed for a Tamden-Fan V/STOL Nacelle.
N82-11042/0 1077

A Summary of V/STOL Inlet Analysis Methods.
N82-11043/8 1077

VACCINES

International Symposium on Nuclear Techniques in the Study and Control of Parasitic Diseases of Man and Animals.
AD-A107 302/2 1123

VAGOTOMY

Verdict on Vagotomy.
AD-A106 959/0 1122

VAGUS NERVE

Verdict on Vagotomy.
AD-A106 959/0 1122

VALLEYS

Categorization of Nocturnal Drainage Flows in the Anderson Creek Valley.
DE81024374 1086

VALVES

Testing of RPMI-1640 as a Nutrient Medium for Fresh Semilunar Valve Storage.
AD-A106 824/6 1140

VANADIUM

Health Hazard Evaluation Report No. HE-79-14-760 at General Electric Company, Evendale,Ohio,
PB82-107228 1140

VANADIUM BASE ALLOYS

Tensile Properties and Microstructure of Helium-Injected and Reactor-Irradiated V-20 Ti.
DE81032005 1192

VAPOR DEPOSITION

Model for the Elongation of Boron on Tungsten during Chemical Vapor Deposition.
AD-A106 989/7 1191

VARIABLE SWEEP WINGS

Wind Tunnel Test of a Self-Optimizing Flexible Technology Wing.
AD-A106 926/9 1077

VARIATIONAL PRINCIPLES

An Energy Integral and Variational Principle for Plasma Kinetic Modes.
N82-11926/4 1261

VEGETATION GROWTH

The Environmental Vegetation Index: A Tool Potentially Useful for Arid Land Management.
N81-29505/7 1081

VEHICLE EQUIPMENT

An Integrated Approach to the Optimization of High-Speed Cam-Follower Systems.
AD-A107 387/3 1224

VEHICULAR ARMOR

Independent Evaluation Plan for Crew Ballistic Shelter for the M110A2. Revision.
AD-A107 066/3 1250

VEHICULAR TRAFFIC CONTROL

Traffic Diversion Software Applications Summary.
PB82-131673 1212

Alternative Sign Sequences for Work Zones on Rural Highways. Executive Summary.
PB82-132812 1213

VENTILATION

Air Exchange Measurements in a High Rise Office Building.
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VERMONT

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VETERANS (MILITARY PERSONNEL)

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VIBRATION

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VIBRATION MODE

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N82-11465/3 1225

VIBRATIONAL SPECTRA

Vibrational Spectra of Oxygen- and Boron-Isotopically Substituted B2O3 Glasses.
AD-A107 333/7 1189

Isotope Effect in Gas-Surface Vibrational Energy Transfer. Cyclopropane and Cyclopropane-d6 Isomerization by the VEM Technique.
AD-A107 365/9 1149

VIDEO SIGNALS

IRIG-TIME Synchronized Binary Video Data Inserter.
AD-A107 119/0 1233

VIDEO TAPES

Review of Government-Wide Contracting Systems for Film and Videotape Productions.
AD-A107 175/2 1089

VIEWERS

Investigation of Combustion Process Using Fiber Optics.
AD-A107 029/1 1264

VIEWING

Real-Time 3D X-Ray and gamma-Ray Viewer.
PAT-APPL-6-267 178 1179

VILLAGES

Historic Resource Study and Historic Structure Report Ninety Six: A Historical Narrative,
PB82-140351 1104

VINYL PLASTICS

Synthesis, Radiation Degradation, and Electron Beam Resist Behavior of Fluorine-Containing Vinyl Polymers.
AD-A106 913/7 1194

VIRGIN ISLANDS

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VIRGINIA

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GJBX-92(80)(V.2E) 1165

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HRP-0903694/8 1124

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Virginia, Volume 46, Part 2.
HRP-0903695/5 1125

VIRUS DISEASES

A Multidisciplinary Program of Infectious Disease Surveillance along the Transamazon Highway in Brazil: Epidemiology of Arbovirus Infections.
AD-A107 008/5 1123

VIRUSES

A Multidisciplinary Program of Infectious Disease Surveillance along the Transamazon Highway in Brazil: Epidemiology of Arbovirus Infections.
AD-A107 008/5 1123

Studies on the Rapid Detection of Dengue Virus Antigen by Immunofluorescence and Radioimmunoassay,
PB82-136052 1133

VISCOUS FLOW

Analytical and Experimental Study of Flow Phenomena in Noncavitating Rocket Pump Inducers.
N82-11031/3 1270

VISUAL AIDS

Aids to Navigation Principal Findings on the CAORF Experiment. The Performance of Visual Aids to Navigation as Evaluated by Simulation.
AD-A107 045/7 1236

VISUAL PERCEPTION

Technical Communication--Taking the User into Account.
AD-A107 030/9 1107

VOCODERS

The Spectral Envelope Estimation Vocoder.
AD-A107 063/0 1233

VOICE COMMUNICATIONS

Flow Control and Routing Techniques for Integrated Voice and Data Networks,
AD-A107 140/6 1233

FAA's Communications Equipment Replacement Plans.
AD-A107 186/9 1233

Digital Signal Sorting for Digitized Speech in an Environment of Common Digital Data Signals.
AD-A107 266/9 1233

VOIDS

Using Diffusion Measurements to Determine Pore-Size Distributions in Porous Materials.
LA-UR-80-635(Rev.) 1151

VOLTAGE

Industry Views on the Ability of the U.S. Photovoltaics Industry to Compete in Foreign Markets.
AD-A106 881/6 1097

VOLTMETERS

The Direct Determination, by Differential Pulse Anodic-Stripping Voltammetry at the Thin Mercury-Film Electrode, of Cadmium, Lead, and Copper,
PB82-133125 1152

VON KARMAN SWIRLING FLOWS

The Von Karman Swirling Flows.
AD-A107 010/1 1253

VORTEX FLAPS

Effects of Vortex Flaps on the Low-Speed Aerodynamic Characteristics of an Arrow Wing.
N82-11013/1 1077

VULNERABILITY

The United States Remains Unprepared for Oil Import Disruptions. Volume I. Summary: Includes Conclusions and Recommendations.
AD-A106 921/0 1180

The United States Remains Unprepared for Oil Import Disruptions. Volume II. Detailed Review of Current Emergency Programs and Alternative Approaches.
AD-A106 922/8 1180

WAIRAKEI GEOTHERMAL FIELD

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LBL-10839 1166

WAIVER

SBA's Progress in Implementing the Public Law 95-507 Subcontracting and Surety Bond Waiver Provisions has been Limited.
AD-A106 840/2 1088

WAKES

A Wake Source Model for Asymmetric Potential Flow past Bodies of Wedge Shape.
N82-11036/2 1254

A Wake Source Model for Non-Symmetric Flow past Bluff Bodies in Two-Dimensional Flow.
N82-11037/0 1076

WALL JETS

A Study of Wall Jets and Tangentially Blown Wings.
AD-A106 986/3 1077

WALLEYE
Intensive Culture of Walleye ('Stizostedion vitreum vitreum'),
PB82-136391 1121

WALLS
New Measurement Strategy for in Situ Testing of Wall Thermal Performance.
LBL-8822 1226

Design of Concrete Walls with Shear Failure (Diseno de Muros de Concreto Con Falla Por Cortante),
PB82-135385 1226

WAR GAMES
Wartime Requirements for Ammunition Materiel and Personnel (WARRAMP). Volume I. Materiel Postprocessor User's Manual.
AD-A107 076/2 1232

Some Guidelines for Effective Task Design in Command and Control Simulations.
AD-A107 424/4 1108

WARM FRONTS
Evaluation of Photogrammetric Flight under Icing Conditions on March 23, 1978.
N82-11725/0 1087

WARNING SYSTEMS
Aircraft Alerting Systems Standardization Study. Volume I. Candidate System Validation and Time-Critical Display Evaluation.
AD-A107 225/5 1079

The Worldwide Navigational Warning Service,
AD-A107 372/5 1234

WASHING
Method of Neutralizing the Corrosive Surface of Amine-Cured Epoxy Resins.
PAT-APPL-6-293 412 1195

WASHINGTON
National Hydroelectric Power Resources Study. Preliminary Inventory of Hydropower Resources. Volume 1. Pacific Northwest Region.
DOE/RA/11025-T1(V.1) 1186

WASHINGTON (STATE)
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Washington, Volume 47.
HRP-0903698/9 1125

WASTE DISPOSAL
Installation Restoration Program Records Search for Langley Air Force Base, Virginia.
AD-A106 864/2 1203

Final Environmental Statement. Sebewaing River, Michigan. Operation and Maintenance, Confined Disposal Facility, and Flood Control Facilities.
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Confined Disposal Facility and Maintenance Dredging of the Les Cheneaux Island Federal Navigation Channels, Michigan.
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AD-A107 358/4 1205

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Analysis of Space Systems Study for the Space Disposal of Nuclear Waste Study Report. Volume 2: Technical Report.
N82-11889/4 1245

Survey of On-Going and Completed Remedial Action Projects.
PB82-134115 1213

Coal Combustion Waste Manual: Evaluating Impacts to Fish and Wildlife.
PB82-141359 1216

WASTE HEAT UTILIZATION
High Temperature Metallic Recuperator.
PB82-141102 1202

WASTE PROCESSING PLANTS
Waste-to-Energy Systems Institutional Barriers Assessment Workshop.
DE82000098 1267

WASTE RECYCLING
Metals Recovery from Wastes. June, 1976-1981 (Citations from the Energy Data Base).
PB82-859604 1194

WASTE TREATMENT
Wastewater Treatment by a Prototype Slow Rate Land Treatment System,
AD-A106 975/6 1080

Waste Water Treatment. June, 1970-1981 (Citations from the Engineering Index Data Base).
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WASTE UTILIZATION
Purox Pyrolysis Process. 1976-1981 (Citations from the Energy Data Base).
PB82-859521 1269

WASTE WATER
Characterization of Pollutants at Holston Army Ammunition Plant,
AD-A107 340/2 1149

Partitioning of Major, Minor, and Trace Elements During Simulated In-Situ Oil Shale Retorting.
LBL-9062 1151

Potential Uses of Spent Shale in the Treatment of Oil Shale Retort Waters.
LBL-11072 1209

WATER
Linearization of the Water Sorption Isotherm for Homogeneous Ingredients Over aw 0.30 - 0.95.
AD-A107 160/4 1149

Biophysics of Water: A Working Conference.
AD-A107 336/0 1120

Behavior of Alkali Metal-Acid Phosphates During Elevated Temperature Water Electrolysis.
DE82000243 1267

WATER ANALYSIS
Characterization of Pollutants at Holston Army Ammunition Plant,
AD-A107 340/2 1149

On-Site GC/MS Analysis of Chapman Gasification Separator Liquor.
PB82-107285 1152

WATER CEMENT RATIO
Mixing Water and Maturity of Hardened Concrete Using Scanning Electron Microscope Techniques. Part One.
PB82-133729 1220

WATER COLOR
Development of the Coastal Zone Color Scanner for Nimbus 7. Volume 1: Mission Objectives and Instrument Description.
N82-11511/4 1228

WATER COOLED REACTORS
Development of Depletion Perturbation Theory for a Reactor Nodal Code.
DE81030695 1247

Planning Support Document for the EPRI Light-Water-Reactor Fuel-Rod-Performance Program.
DE82900104 1248

WATER DISTRIBUTION
Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume I,
PB82-131426 1211

Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume II,
PB82-131434 1211

WATER FLOW
Descriptive and Sensitivity Analyses of Watbali: A Dynamic Soil Water Model.
N81-29507/3 1170

Firefighting Module Development.
N82-11311/9 1225

WATER HYACINTH
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AD-A107 083/8 1155

WATER JET CUTTING
Water Jet Perforation: A New Method of Completing and Simulating In situ Leaching Wells.
PB82-135583 1167

WATER JETS
Cutting Ice with High Pressure Water Jets--Translation.
AD-A106 985/5 1169

WATER LEVELS
Lake Memphremagog-St. Francis River Basin Overview.
PB82-108101 1160

Effect of Irrigation Pumping on the Ground-Water System in Newton and Jasper Counties, Indiana.
PB82-137688 1081

WATER POLLUTION
Oxygen Dynamics Study - Susquehanna River Below Conowingo Dam, Maryland: Volume I.
PB82-135971 1136

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WATER POLLUTION CONTROL
Treatability Studies of Pesticide Manufacturing Wastewaters: Ethylenebisdithiocarbamate Fungicides.
PB82-107566 1210

NPDES Compliance Monitoring Inspector Training: Overview.
PB82-136342 1214

NPDES Compliance Monitoring Inspector Training: Legal Issues.
PB82-136359 1214

NPDES Compliance Monitoring Inspector Training: Biomonitoring.
PB82-136367 1214

NPDES Compliance Monitoring Inspector Training: Sampling Procedures.
PB82-136375 1214

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WATER POLLUTION DETECTION
On-Site GC/MS Analysis of Chapman Gasification Separator Liquor.
PB82-107285 1152

Inductively Coupled Plasma-Atomic Emission Spectrometric Analysis of Environmental Samples Using Ultrasonic Nebulization.
PB82-118209 1229

Use of Aquatic Oligochaete, 'Lumbriculus variegatus', for Effluent Biomonitoring.
PB82-137621 1136

WATER POLLUTION EFFECTS (ANIMALS)
Acclimation Temperature: An Important Factor Influencing the Interaction of Chlorine, delta T and Exposure Duration to Eggs, Prolarvae and Larvae of Striped Bass, 'Morone saxatilis',
PB82-118894 1145

Effects of Pollution on Freshwater Fish.
PB82-127358 1136

Effect of Fluctuating Exposures on the Acute Toxicity of Ammonia to Rainbow Trout (Salmo gairdneri) and Cutthroat Trout (S. clarki).
PB82-128158 1145

Marine and Estuarine Pollution.
PB82-128174 1136

Influence of Drilling Muds on the Primary Chemosensory Neurons in Walking Legs of the Lobster, 'Homarus americanus'.
PB82-128190 1136

Baseline Study of Effects of Ionizing Radiation on the Chromosomes of the Marine Worm, 'Neanthes arenaceodentata'.
PB82-131517 1143

WATER QUALITY
Automated Water Monitor System Field Demonstration Test Report. Volume 1: Executive Summary.
N82-11991/8 1209

Automated Water Monitor System Field Demonstration Test Report. Volume 2: Technical Summary.
N82-11992/6 1209

User's Guide to the Physical Habitat Simulation System (PHABSIM).
PB82-134222 1160

Susquehanna River Anadromous Fish Studies, Conowingo Dam to Havre De Grace, Maryland.
PB82-135963 1121

WATER QUALITY DATA
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PB82-129305 1160

Water Resources Data for Indiana, Water Year 1980.
PB82-135930 1160

Water Resources Data for Florida, Water Year 1980. Volume 1: Northeast Florida.
PB82-136110 1160

Water Resources Data for Florida. Volume 4: Northwest Florida.
PB82-136128 1160

WATER RECLAMATION
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N82-11991/8 1209

Automated Water Monitor System Field Demonstration Test Report. Volume 2: Technical Summary.
N82-11992/6 1209

WATER RESERVOIRS
Heat Storage in Ground Water. Part 1. Study of Ground Water Reservoirs.
NE-PROJ-2060591(Pt.1) 1188

WATER RESOURCES
Water-Resources Information for the Withlacoochee River Region, West-Central Florida.
AD-A106 929/3 1159

Water Availability for Development of Major Tar Sands Areas in Utah.
LETC-0013-1 1166

Androscoggin River Basin Overview.

PB82-107137 1160

Piscataqua and New Hampshire Coastal River Basins Overview.
PB82-107145 1160

Saco and Southern Maine Coastal River Basins Overview.
PB82-107517 1210

Lake Memphremagog-St. Francis River Basin Overview.
PB82-108101 1160

Federal Water Resources Research: A Review of the Proposed Five-Year Program Plan.
PB82-135559 1214

Remote Sensing Applied to Hydrology. 1964-November, 1981 (Citations from the NTIS Data Base).
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WATER SOURCE HEAT PUMPS

Heat Storage in Ground Water. Part 2. Study of Distribution Systems.
NE-PROJ-2060591(Pt.2) 1188

WATER STORAGE

Colorado River Simulation System: An Executive Summary.
PB82-139387 1161

WATER SUPPLIES

Eliminating Contractor Inspections of Federal Water Projects Could Save Millions.
AD-A106 838/6 1203

WATER SUPPLY

Simulated Interactions between the Proposed Narrows Reservoir and the Water-Table Aquifer Along the South Platte River, Morgan County, Colorado.
PB82-131483 1211

Borehole Data-Collection Methods Applicable for the Regional Observation and Monitor Well Program, Southwest Florida Water Management District.
PB82-133448 1160

Effect of Irrigation Pumping on the Ground-Water System in Newton and Jasper Counties, Indiana.
PB82-137688 1081

Mean Annual Streamflow of Selected Drainage Basins in the Coal Area of Southeastern Montana.
PB82-137696 1160

WATER TREATMENT

Wastewater Treatment by a Prototype Slow Rate Land Treatment System,
AD-A106 975/6 1080

Potential Uses of Spent Shale in the Treatment of Oil Shale Retort Waters.
LBL-11072 1209

Removing Trihalomethanes from Drinking Water - An Overview of Treatment Techniques.
PB82-132572 1212

WATER TUNNELS

Kielder Aqueduct Tunnels - Predicted and Actual Geology.
PB82-135302 1214

WATER WAVES

High Solitary Waves in Water: A Refined Numerical Method.
AD-A107 041/6 1156

High Solitary Waves in Water: Results of Calculations,
AD-A107 267/7 1253

Linearized Solution to Inlet Equation with Inertia. Stability of Rubble Mound Breakwaters. Particle Motion under Stokes Waves.
AD-A107 343/6 1156

WATERSHEDS

Hydrogeological and Geochemical Studies in the Perch Lake Basin. A Second Report of Progress.
AECL-6404 1157

Mean Annual Streamflow of Selected Drainage Basins in the Coal Area of Southeastern Montana.
PB82-137696 1160

WAVE EQUATIONS

High Solitary Waves in Water: A Refined Numerical Method.
AD-A107 041/6 1156

WAVE PROPAGATION

Refracted Ray Characteristics from the Geometrical Spreading Equation for Depth-Dependent Media.
AD-A107 216/4 1252

Oblique Propagation of Electron Thermal Modes Below the Electron Plasma Frequency Without Boundary Effects.
N82-11928/0 1261

WAVEGUIDES

A Program to Compute ELF/VLF Earth-Ionosphere Modal Height Gains via WKB Methods up to Satellite Altitudes.
AD-A107 517/5 1264

WEAPON SYSTEMS

Simulation Testing of Weapon Systems.
AD-A106 821/2 1251

Questionable Use of the C-X and Other Air Force Weapon System Funds.
AD-A106 898/0 1231

WEAR

The Wear of Polymers Sliding on Polymeric Films Deposited on Rough Surfaces.
AD-A107 158/8 1195

Determination of Sample Container Effects on Wearmetals Concentration in MIL-L-7808 Synthetic Lubricant Analyzed on an A/E35U-3 Fluid Analysis Spectrometer.
AD-A107 323/8 1194

WEAR RESISTANCE

Lubrication and Wear Resistance of Dynamic Seals. 1973-November, 1981 (Citations from the BHRA Fluid Engineering Data Base).
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WEATHER

Using DOE-2 at Lawrence Berkeley Laboratory.
LBL-8772 1087

WEATHER FORECASTING

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Fog Prediction. 1964-November, 1981 (Citations from the NTIS Data Base).
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WEATHER MODIFICATION

Continuing Design Work for the Sierra Cooperative Pilot Project: Interim Report No. 4,
PB82-136607 1087

WEATHER STATIONS

Remote Automatic Weather Station for Resource and Fire Management Agencies.
PB82-107335 1087

WEDGES

A Wake Source Model for Asymmetric Potential Flow past Bodies of Wedge Shape.
N82-11036/2 1254

WELDED JOINTS

Influence of Irradiation on the Tensile Properties of Austenitic Stainless Steel Weldments.
DE81032002 1221

Weldability of Thermally Grain-Refined Fe-12Ni-0.25Ti for Cryogenic Structural Applications.
LBL-10259 1192

WELDED PIPES

Goal: Better Standards for Pipeline Welds.
PB82-134008 1213

WELL STIMULATION

Water Jet Perforation: A New Method of Completing and Simulating In situ Leaching Wells.
PB82-135583 1167

WEST VIRGINIA

Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Ohio, Pennsylvania and West Virginia: Canton Quadrangle. Final Report.
GJBX-92(80)(V.2A) 1165

Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Ohio and West Virginia: Charleston Quadrangle. Final Report.
GJBX-92(80)(V.2D) 1165

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Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: West Virginia, Volume 48, Part 1.
HRP-0903696/3 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: West Virginia, Volume 48, Part 2.
HRP-0903697/1 1125

WETLANDS

An Assessment of Wetland Habitat Establishment at a Central Florida Phosphate Mine Site.
PB82-130808 1211

WHEAT

Soil Moisture Inferences from Thermal Infrared Measurements of Vegetation Temperatures.
N81-29500/8 1169

Evaluation of Spring Wheat and Barley Crop Calender Models for the 1979 Crop Year.
N81-29508/1 1081

Risk and Allocative Errors Due to Imperfect Information: The Impact on Wheat Technology in Tunisia.
PB82-134552 1080

WHEEL CHAIRS

Motorized Wheel Chair.
PAT-APPL-6-288 197 1140

WHEELS

Identification of Wheelset/Rail Creep Coefficients from Dynamic Response Data Using the Maximum Likelihood Parameter Identification Technique.
AD-A107 447/5 1221

WHITE PLAINS RESERVOIR NUMBER 1 DAM

National Dam Safety Program. White Plains Reservoir Dam Number 2 (Inventory Number N.Y. 24), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 409/5 1207

WILDLIFE

Convention on International Trade in Endangered Species of Wild Fauna and Flora; 1979 Annual Report for the United States of America.
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PB82-130816 1211

Coal Surface Mining Reclamation and Fish and Wildlife Relationships in the Eastern United States. Volume II: Opportunities and Approaches for Fish and Wildlife Planning and Management in Coal Surface Mining, Reclamation and Postmining Land Uses.
PB82-130824 1211

WIND

A Two-Dimensional Finite Element Advection Model with Variable Resolution.
AD-A107 511/8 1086

Categorization of Nocturnal Drainage Flows in the Anderson Creek Valley.
DE81024374 1086

Overview, Current Status, and Future Plans for the DOE Atmospheric Studies in Complex Terrain (ASCOT) Program.
DE81024417 1086

Implication of Spatial Averaging in Complex Terrain Wind Studies.
DE81024451 1087

Comparison of a Drainage Flow Model with the Data of Manins and Sawford.
DE81025366 1087

WIND POWER

Solar 79 Northwest.
CONF-790845-(Sup.) 1181

Preliminary Estimates of Wind Power Potential at the Nevada Test Site.
PB82-127036 1183

WIND POWER GENERATION

A Two-Dimensional Study of the Maximum Power That Can Be Obtained from a Wind Turbine in a Wind Shear Layer,
PB82-136987 1187

WIND POWER PLANTS

Programmatic Environmental Assessment Wind-Energy-Conversion Systems (WEC) Program. Issues-Identification Report.
DE81027410 1185

WIND TUNNEL APPARATUS

Space Shuttle Solid Rocket Booster Sting Interference Wind Tunnel Test Analysis.
N82-11040/4 1272

WIND TUNNEL MODELS

Space Shuttle Solid Rocket Booster Sting Interference Wind Tunnel Test Analysis.
N82-11040/4 1272

WIND TUNNEL TESTS

Effects of Vortex Flaps on the Low-Speed Aerodynamic Characteristics of an Arrow Wing.
N82-11013/1 1077

Wind-Tunnel Results for a Modified 17-Percent-Thick Low-Speed Airfoil Section.
N82-11033/9 1076

Space Shuttle Solid Rocket Booster Sting Interference Wind Tunnel Test Analysis.
N82-11040/4 1272

Icing Tunnel Tests of a Composite Porous Leading Edge for Use with a Liquid Anti-Ice System.
N82-11052/9 1078

Helicopter Rotor Trailing Edge Noise.
N82-11859/7 1078

WIND TURBINES

A Two-Dimensional Study of the Maximum Power That Can Be Obtained from a Wind Turbine in a Wind Shear Layer,
PB82-136987 1187

WINDPOWER GENERATION

Economic Analysis of Ocean Thermal and Wind Power Plants and Power Generation. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).
PB82-859737 1184

WINDSHIELDS

Windshield Damage and Driving Safety.
PB82-128653 1225

WING LOADING

A Study on Numerical Method for Evaluating Spanwise Integral in Subsonic Lifting-Surface Theory.
N82-11035/4 1076

Aeroacoustic Theory for Noncompact Wing-Gust Interaction.
N82-11071/9 1078

WING PROFILES
An Influence Coefficient Method for the Application of the Modal Technique to Wing Flutter Suppression of the Dast Arw-1 Wing.
N82-11070/1 1078

WING TANKS
Experimental Study of Fuel Heating at Low Temperatures in a Wing Tank Model, Volume 1.
N82-11224/4 1268

WINGS
Aircraft Wing Trailing-Edge Noise.
N82-11039/6 1076

WINNIBIGOSHISH DAM
Structural Stability Evaluation, Winnibigoshish Dam.
AD-A107 337/8 1205

WINTER
Bottom Heat Transfer to Water Bodies in Winter.
AD-A106 977/2 1159

Mine/Countermine Problems During Winter Warfare.
AD-A107 047/3 1231

Meridional Heat Transport at the Onset of Winter Stratospheric Warming.
N82-11697/1 1065

WISCONSIN
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Wisconsin, Volume 49, Part 1.
HRP-0903691/4 1124

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Wisconsin, Volume 49, Part 2.
HRP-0903692/2 1124

Occupational Injuries and Illnesses, Wisconsin, 1979.
PB82-100058 1139

WOOD
Overview of Considerations in Assessing the Biomass Potential of Army Installations.
AD-A107 132/3 1266

Biomass in Southeastern Forests.
PB82-133422 1082

A Wooden Energy Demonstration Center in Alabama. Phase I: A Background Investigation.
PB82-134271 1082

WOOD BURNING APPLIANCES
Air Pollution from Residential Woodburning Appliances: An Annotated Bibliography.
DE82000514 1209

WOOD FUELS
MASEC Industrial Fuel-Wood Program.
DE82000461 1268

Air Pollution from Residential Woodburning Appliances: An Annotated Bibliography.
DE82000514 1209

WOODEN STRUCTURES
Fire Endurance Under Design Load for Walls of One-Story Three-Room Structures of Sandwich and Wood-Frame Construction,
PB82-144601 1227

Wooden construction. 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859109 1227

WORD RECOGNITION
Effect of Task Duration on Voice Recognition System Performance.
AD-A107 442/6 1104

WORK
Effect of Work Schedule, and Description of Career Intention on Organizational Effectiveness.
AD-A106 819/6 1105

WORK TIME STANDARDS
Methods and Standards System.
PB82-121799 1091

Methods and Standards System. Computer Operation Manual.
PB82-121807 1091

WORMS
Use of Aquatic Oligochaete, 'Lumbriculus variegatus', for Effluent Biomonitoring.
PB82-137621 1136

WWNWS (WORLDWIDE NAVIGATIONAL WARNING SERVICE)
The Worldwide Navigational Warning Service,
AD-A107 372/5 1234

WYOMING
Aerial Radiometric and Magnetic Reconnaissance Survey of South-Central Colorado Trinidad Quadrangle.
GJBX-59(80)(V.2) 1164

Aerial gamma Ray and Magnetic Survey: Idaho Project, Ogden Quadrangle, Utah and Wyoming. Final Report.
GJBX-71(80)(V.2)(OGDEN) 1164

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Wyoming, Volume 50.
HRP-0903693/0 1124

X RAY APPARATUS
Standard Specification for Apparatus for gamma Radiography.
N82-11433/1 1228

X RAY ASTRONOMY
Relations among Stellar X-ray Emission Observed from Einstein, Stellar Rotation and Bolometric Luminosity.
PB82-133869 1083

X RAY DIFFRACTION
X-Ray Diffraction Study of Zr(Ca, Y)O sub 2-x; The Disordered State.
AD-A107 013/5 1252

Development of Microfabrication Techniques.
AD-A107 126/1 1222

Corrosion Mechanism of Cu-9.4 Ni-1.7 Fe Alloy in 3.4 WT.% NaCl Solution with and without Sulfide Contamination.
AD-A107 393/1 1149

X RAY FLUORESCENCE ANALYSIS
Chemical Analysis of Aerosols and Airborne Particulates. 1977-June, 1980 (Citations from the NTIS Data Base).
PB82-802422 1154

Chemical Analysis of Aerosols and Airborne Particulates. July, 1980-November, 1981 (Citations from the NTIS Data Base).
PB82-802430 1154

X-Ray Fluorescence Analysis. 1975-June, 1980 (Citations from the NTIS Data Base).
PB82-802778 1154

X-Ray Fluorescence Analysis. July, 1980-November, 1981 (Citations from the NTIS Data Base).
PB82-802786 1154

X RAY SPECTRA
Applications of the Microscan 9 Microanalyser.
AD-A106 969/9 1148

X RAYS
Real-Time 3D X-Ray and gamma-Ray Viewer.
PAT-APPL-6-267 178 1179

XENON
Proton Spectra in High-Energy Pion-Nuclei Collisions Not Accompanied by Multiparticle Production.
JINR-E-1-11975 1258

Proton Multiplicity Distribution of High-Energy Pion-Nuclei Collisions.
JINR-E-1-11976 1258

Proton Multiplicity Distributions in High-Energy Hadron-Nuclei Collisions.
JINR-E-1-12088 1258

YANG-MILLS THEORY
OSp(1,4)-Superfields in Chiral Representation.
JINR-E-2-12364 1261

YEASTS
Bread and Bakery Products: Microbiology. 1978-1981 (Citations from the Information Retrieval, Ltd. Data Base).
PB82-859711 1138

YIELD
Research on Metal Halide Laser Systems.
AD-A107 398/0 1255

YUKAWA POTENTIAL
Upper Limits for the Number of Bound States Associated with the Yukawa Potential,
PB82-140625 1261

ZENITH
Computation of Averaged Monthly Zonal Albedo Utilizing the Solar Zenith Angle, Properties of Clear and Cloudy Atmospheres.
N82-12010/6 1082

ZINC
Pore Size, Zinc Penetration, and Zinc Diffusion Studies on PPO/CA Separators.
AD-A107 354/3 1187

Temperature Limitations of Alkaline-Battery Electrodes. Part 1. The Electrochemical Kinetic Behavior of Iron, Nickel, and Zinc in Concentrated Sodium Hydroxide Solutions. Final Report.
DE81027235 1187

Energy Savings by Means of Fuel-Cell Electrodes in Electro-Chemical Industries. Progress Report, February 1, 1981-April 30, 1981.
DE81030975 1185

Zinc and Zinc Alloys as Protective Coatings. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859935 1190

ZINC ALLOYS
Zinc and Zinc Alloys as Protective Coatings. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859935 1190

ZINC COATINGS
Zinc and Zinc Alloys as Protective Coatings. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859935 1190

ZIRCALOY
Nuclear Materials Research Progress Reports for 1979.
LBL-11030 1249

ZIRCALOY 4
Simulation of the Chemical State of Irradiated Oxide Fuel; Influence of the Internal Corrosion on the Mechanical Properties of Zry-4 Tubing.
KFK-2785 1247

ZIRCONIUM COMPOUNDS
X-Ray Diffraction Study of Zr(Ca, Y)O sub 2-x; The Disordered State.
AD-A107 013/5 1252

ZOOPLANKTON
Investigation of Hydrodynamic and Behavioral Factors That Affect Zooplankton Sampling by Pumps.
PB82-137886 1122

PERSONAL AUTHOR INDEX

NTIS®

This index is arranged by personal author's last name followed by either a first name or an initial. NASA and DoE reports do not spell out an author's first name, but use only initials. As many as five authors may be included for each citation; all are listed in this index.

SAMPLE ENTRY

KAUSEL, E.
Computation of Hankel Transforms Using the Fast-Fourier Transform Algorithm.
PB80-104045 33

Author name
Title
NTIS order number Page number

ABBATIELLO, L. A.
Theory and Design of an Annual Cycle Energy System (ACES) For Residences.
ORNL/CON-43 1201

ABBOTT, L. S.
Interim Assessment of the Denatured exp 233 U Fuel Cycle: Feasibility and Nonproliferation Characteristics.
ORNL-5398(Exec.Sum.) 1248

ABDELRAZIK, M.
A Model Describing the Microwave Emission from a Multi-Layer Snowpack at 37 Ghz.
N82-11510/6 1169

ABELL, JOHN B.
An Evaluation of Spares Acquistion Integrated with Production,
AD-A107 279/2 1231

ACCORTT, J. I.
Industrial Coal-Fired Fluidized-Bed Demonstration Program. Progress Report, April 30-May 1, 1980.
DE82000122 1265

ACHENBACH, J. D.
Fields near a Rapidly Propagating Crack-Tip in an Elastic Perfectly-Plastic Material.
AD-A107 350/1 1195

ACKELS, A. A.
Evaluation of Low-Cost Extrusion Cooker in Sri Lanka.
PB82-133786 1137

ADAMS, GEORGE F.
Formaldehyde: Electronic Structure Calculations for the S(0) and T(1) States.
AD-A107 016/8 1148

ADAMS, H.
Geohydrology of Bandelier National Monument, New Mexico.
LA-8461-MS 1160

ADAMS, M. A.
Fracture Mechanics of Cellular Glass.
N82-11209/5 1189

ADAMS, R. E. W.
Radar Mapping, Archaeology, and Ancient Land Use in the Maya Lowlands.
N82-11514/8 1104

ADAMS, W. H.
Water Quality in the Vicinity of Fenton Hill Site, 1978. Progress Report.
LA-8217-PR 1136

ADDIEGO, JEFFREY C.
Colorado River Simulation System: An Executive Summary,
PB82-139387 1161

ADELSON, M.
Multiple Perspective Concept with Applications to Technology Assessment and Other Decision Areas.
PB82-128604 1091

The Multiple Perspective Concept with Applications to Technology Assessment and Other Decision Areas (Condensed Version),
PB82-128612 1091

ADLER, ERIC L.
The Effect of Acoustic Dispersion and Attenuation on SAW Convolver Performance.
AD-A107 057/2 1178

Electromagnetic Long-Line Effects in Surface Wave Convolvers.
AD-A107 060/6 1252

ADLER, THOMAS J.
Techniques for Analyzing the Performance of Rural Transit Systems. Volume I.
PB82-106436 1221

AFANAS'EV, G. N.
Special Relativistic Two-Body Problem. 1. Past.
JINR-E-2-12390 1261

AGARWAL, A. K.
Princetown I Data Analysis.
MLM-2731(OP) 1268

AGGARWAL, R. L.
Spatial Separation of Carriers in InAs-GaSb Superlattices.
AD-A107 155/4 1263

AGIN, G.
Machine Intelligence Research Applied to Industrial Automation.
PB82-133075 1222

AI, FENGRONG
A New Concept on Chiasmal Architecture and Its Projection on the Retina,
PB82-136060 1133

AINSWORTH, BRUCE A.
National Dam Safety Program. No Name 165 (Crystal Lake Dam) (MO 10580), Missouri - Kansas City Basin, Jackson County, Missouri. Phase I Inspection Report.
AD-A107 542/3 1208

AKENS, GEORGE
Technical and Economic Evaluation of Mine Closure Procedures.
PB82-136995 1167

AKERS, C. K.
Aerosol Composition in the Marine and Coastal Boundary Layer.
AD-A107 308/9 1084

AKEY, N. D.
Technology Transfer of NASA Microwave Remote Sensing System.
N82-11515/5 1228

AKSELROD, SOLANGE
Power Spectrum Analysis of Heart Rate Fluctuation: A Quantitative Probe of Beat-to-Beat Cardiovascular Control.
AD-A106 978/0 1142

AL-DABASS, D.
Simulation of a Two-Dimensional Multiprocessor Structure,
PB82-136953 1177

ALAM, J.
Integration, Interpretation and Evaluation of Results in a Multi-Well Interference Test Project. Quarterly Financial Summary and Monthly Technical Report.
DE81030377 1161

ALBRECHT, R. M.
Scanning Electron Microscopy/1981/III. An International Journal of Scanning Electron Microscopy, Related Techniques, and Applications. Part III,
AD-A107 525/8 1140

ALBRIGHT, J. A.
Location of Hydraulic Fractures Using Microseismic Techniques.

PERSONAL AUTHOR INDEX

LA-UR-80-2103 1165

ALCOUFFE, R. E.
Transport and Reactor Theory. Progress Report, April 1-June 30, 1979.
LA-8057-PR 1249

ALDABASS, D.
Design Concepts for a Hierarchical Two Dimensional Multiprocessor Structure,
PB82-135833 1176

ALEXANDER, P. J.
Control Panels - Layout and Design,
PB82-132051 1222

ALLEN, BRENDA J.
An Evaluation of Spares Acquistion Integrated with Production,
AD-A107 279/2 1231

ALLEN, ERWIN C.
Planning Amphibious Lift Forces. Appendix. Amphibious Ship Capacity Handbook.
AD-A106 949/1 1224

ALLEN, G. C.
Systems Studies of Waste Transportation.
DE81030840 1243

ALLEN, GARY W.
Dental Emergencies Occurring among U.S. Army Recruits.
AD-A107 271/9 1123

Predictability of Dental Emergencies by Panography.
AD-A107 272/7 1123

ALLEN, JOHN L.
Biological Activity and Chemical Characteristics of Dredge Material from 10 Sites on the Upper Mississippi River,
AD-A107 276/8 1135

ALLEN, ROBERT H.
Attenuation Problems Associated with a 5 cm Radar.
AD-A107 215/6 1238

ALSCHULER, JOHN
Municipal Energy Initiatives in the Northeast,
PB82-144569 1184

ALSMILLER, R. G. JR.
Calculation of Nsutron and gamma Ray Energy Spectra for Fusion Reactor Shield Design: Comparison with Experiment.
ORNL/TM-7360 1240

Monte Carlo Simulation of Molecular Flow in a Neutral-Beam Injector and Comparison with Experiment.
DE82000503 1239

ALTSCHUL, JEFFREY H.
Cultural Resources Investigations at Redstone Arsenal, Madison County, Alabama. Volume I.
AD-A107 151/3 1103

Cultural Resources Investigations at Redstone Arsenal, Madison County, Alabama. Volume II.
AD-A107 152/1 1103

ALWIS, N. A. W. A. T.
Bibliography of Scientific Literature on Sri Lanka and by Sri Lankan Scientists Relating to Agriculture, Forestry, Veterinary Sciences and Fisheries, 1960-1978: Volume I,
PB82-138165 1081

Bibliography of Scientific Literature on Sri Lanka and by Sri Lankan Scientists Relating to Agriculture, Forestry, Veterinary Sciences and Fisheries, 1960-1978: Volume II,
PB82-138173 1081

Bibliography of Scientific Literature Relating to Sri Lanka: First Supplement,
PB82-138157 1096

AMANO, T.
Boosting Up of Neutral Beam Heating Power by Slowly Rising Toroidal Field.
N82-11929/8 1240

AMENDOLA, A.
Analysis of Complete Logical Structures in System Reliability Assessment,
PB82-138363 1242

RSM Development for Nuclear Safety Analysis. A Test Problem,
PB82-138389 1242

AMIER, R. K.
Helicopter Rotor Trailing Edge Noise.
N82-11859/7 1078

AMIS, M. L.
Evaluation of Large Area Crop Estimation Techniques Using Landsat and Ground-Derived Data.
N81-29511/5 1081

ANDER, M. E.
Magnetotelluric/Audiomagnetotelluric Study of the Zuni Hot Dry Rock Geothermal Prospect, New Mexico.
LA-UR-80-1486 1165

ANDERSON, CARL S. JR.
National Dam Safety Program. Leatherwood Creek Number 5 (Inventory Number VA 08902), Roanoke River Basin, Henry County, Virginia. Phase I Inspection Report.
AD-A107 416/0 1207

ANDERSON, D. L.
Hotspots, Polar Wander, Mesozoic Convection and the Geoid.
N82-11694/8 1158

ANDERSON, GARY
Developer Supply, Investor Demand, and Multifamily Housing Production: A Pilot Study,
PB82-144916 1119

ANDERSON, GARY S.
Assessing the Effects of the Section 8 Program Using the Urban Institute Housing Market Model,
PB82-144445 1101

ANDERSON, JOHN B.
Marine Sediment Core Descriptions IWSOE 68, 69, 70; Deep Freeze 79,
PB82-132127 1158

The Scientific Program USCGC Glacier Deep Freeze 80,
PB82-132879 1159

ANDERSON, R. E.
High-Temperature-Staged Fluidized-Bed Combustion (HITS), Bench Scale Experimental Test Program Conducted During 1980. Final Report.
DOE/ET/15167-191 1265

ANDERSON, W.
Peat Resource Evaluation: State of Maine. Report for the Quarter Ending August 1981.
DE82000227 1157

ANDERSON, WARREN
Water-Resources Information for the Withlacoochee River Region, West-Central Florida.
AD-A106 929/3 1159

ANDO, Y.
New Estimation Method for Flutter or Divergence Boundary from Random Responses at Subcritical Speeds.
N82-11034/7 1077

ANDREWS, B.
Integrated Traffic Simulation Model - Phase I. Volume 2: Design of the TRAF Operating System (TDS).
PB82-139163 1215

Integrated Traffic Simulation Model - Phase I. Volume 3: TRAF Operating System Users Guide.
PB82-139171 1215

ANDREWS, E. H.
Environmental Failure of Adhesive Bonding in Composites.
AD-A107 538/1 1190

ANGOFF, G.
Effect of Low Potassium Diet on Rat Exercise Hyperthermia and Heatstroke Mortality.
AD-A107 006/9 1144

ANGRES, ISAAC
Battery Separators Based on Polyphenylquinoxaline Polymer Blends.
AD-A107 130/7 1195

Pore Size, Zinc Penetration, and Zinc Diffusion Studies on PPQ/CA Separators.
AD-A107 354/3 1187

ANISOVICH, V. V.
Hadron Production in Quark Combination with Colors.
JINR-R-2-12154 1258

ANTONOPOULOS, A. A.
Ethanol Production Via Fungal Decomposition and Fermentation of Biomass. Phase II. Semiannual Progress Report, October 1980-March 1981.
DE82000104 1267

ANTOSIEWICZ, H. A.
Qualitative Properties of Differential Equations.
AD-A107 492/1 1197

AOKI, S.
Magnesium Hydroxide Neutron-Shielding Material and Method of Producing Such Material.
DE81030298 1242

APPLEMAN, BERNARD R.
Epoxy Thermoplastic Pavement Marking Material: Specification and Testing.
PB82-135914 1214

ARAGON, LOURDES
Scientific Research and Basic Needs of the People: A Method of Assessing Research Projects (Investigacion Cientifica Y Necesidades Basicas de la Poblacion: Un Metodo de Evaluacion de Proyectos),
PB82-135419 1092

ARAKI, KIYOMICHI
Analysis of Periodic Ferrite Slab Waveguides by Means of Improved Perturbation Method.
AD-A107 024/2 1170

ARGENTESI, F.
RSM Development for Nuclear Safety Analysis. A Test Problem,
PB82-138389 1242

ARIAS, ARTURO
Trusted Interval in the Fourier Spectra of Accelerograms Digitized Either Manually or by Semi-Automatic Means (Intervalo Confiable en el Espectro de Fourier Obtenido de Acelerogramas Digitizados Manualmente o Con Medios Semiautomaticos),
PB82-135393 1169

ARMSTRONG, A. G. A. M.
COMPUMAG: Papers Presented by Members of the Laboratory at the Conference of the Computation of Electromagnetic Field, Chicago, 14-17 September, 1981,
PB82-134164 1253

ARMSTRONG, GERALD R.
The Single and Multiple Vehicle Pickup and Delivery Problem: Exact and Heuristic Algorithms.
AD-A107 202/4 1199

ARMSTRONG, J. W.
Effect of Operator Mental Loading on Voice Recognition System Performance.
AD-A107 477/2 1234

Effect of Task Duration on Voice Recognition System Performance.
AD-A107 442/6 1104

ARMSTRONG, JAMES A.
Tethered Balloon Sampling Systems for Monitoring Air Pollution.
PB82-126319 1210

ARMSTRONG, T. A.
Characteristics, of Tiros, Goes, Dmsp and Landsat Systems.
N81-29506/5 1272

ARTEAGA-ROMERO, N.
Review on Photon-Photon Collisions in Electron Storage Rings.
LPC-79-03 1260

ARTHUR, E.
Evaluation of the Capture Cross Section of exp 169 Tm from 10 exp -5 EV to 2.10 exp 7 EV.
CEA-CONF-4469 1257

ARYA, L. M.
Evaluation of Gravimetric Ground Truth Soil Moisture Data Collected for the Agricultural Soil Moisture Experiment, 1978 Colby, Kansas, Aircraft Mission.
N81-29494/4 1169

ASAMI, H.
Magnesium Hydroxide Neutron-Shielding Material and Method of Producing Such Material.
DE81030298 1242

ASANOV, R. A.
Special Relativistic Two-Body Problem. 1. Past.
JINR-E-2-12390 1261

ASHTON, GEORGE D.
Bottom Heat Transfer to Water Bodies in Winter.
AD-A106 977/2 1159

ASLAM, M.
Seismic Isolation of an Electron Microscope.
LBL-10386 1228

ASTOLFI, M.
RSM Development for Nuclear Safety Analysis. A Test Problem,
PB82-138389 1242

ATEMA, JELLE
Influence of Drilling Muds on the Primary Chemosensory Neurons in Walking Legs of the Lobster, 'Homarus americanus'.
PB82-128190 1136

ATKINS, ROBERT G.
Consumer Representation in Standards Development: Literature Review and Issue Identification.
PB82-135880 1093

ATTREE, P. M.
EXFOR Dictionaries.
IAEA-NDS-2(Rev.79/6) 1258

ATZHORN, DAVID
Digital Command Augmentation for Lateral-Directional Aircraft Dynamics.
AD-A107 264/4 1079

AUSTIN, KATHRYN G.
USCGC GLACIER 1976 and 1978 Cruises. Rose Sea, Antarctica Sediment Descriptions,
PB82-134503 1159

AVELLINI, BARBARA A.
Heat Balance and Transfer in Men and Women Exercising in Hot-Dry and Hot-Wet Conditions.
AD-A107 004/4 1144

AVILA, WALTER B.
Chemistry of Aryloxazolines. Applications to the Synthesis of Lignan Lactone Derivatives.
AD-A107 224/8 1147

AVITABILE, ALEX S.
Risk of Inner-City Mortgage Lending,
PB82-144627 1101

AVOURIS, PH.
Lifetime Broadening of Excited Pyrazine Adsorbed on Ag(111).
AD-A106 854/3 1148

Time-Resolved Infrared Study of Bimolecular Reactions between Tert-Butly Radicals.
AD-A107 154/7 1148

AYERS, J. E.
The Worldwide Navigational Warning Service,
AD-A107 372/5 1234

AYRES, L. W.
Worldwide Transportation/Energy Demand, 1975-2000. Revised Variflex Model Projections.
ORNL/Sub-79/45740/1 1183

AYRES, R. U.
Worldwide Transportation/Energy Demand, 1975-2000. Revised Variflex Model Projections.
ORNL/Sub-79/45740/1 1183

AYRES, T.
Relations among Stellar X-ray Emission Observed from Einstein, Stellar Rotation and Bolometric Luminosity.
PB82-133869 1083

BACHE, T. C.
Seismological Discrimination and Yield Determination Research.
AD-A107 360/0 1168

The Underwater Acoustic Signature of a Nuclear Explosion at the Ocean Surface.
AD-A107 359/2 1241

BADGER, DONALD W.
Prevention of Low Back Injury in the Industrial Work Force: Symposium Held at Cincinnati, Ohio on November 9, 1972,
PB82-107251 1140

BAES, C. F. III
CRRIS: A Computerized Radiological Risk-Investigation System.
DE82000136 1143

BAGGEROER, A. B.
Digital Signal Processing Research.
AD-A107 124/0 1177

BAGLEY-BAUMGARTNER, K.
Cultural Resources Investigations at Redstone Arsenal, Madison County, Alabama. Volume I.
AD-A107 151/3 1103

Cultural Resources Investigations at Redstone Arsenal, Madison County, Alabama. Volume II.
AD-A107 152/1 1103

BAHL, ROY
Forecasting Municipal Revenues and Expenditures: A Primer and Handbook,
PB82-144528 1093

BAILEY, DAVID LAURENCE
An Analytical and Experimental Analysis of Factors Affecting Exhaust System Performance in Sea Level Static Jet Engine Test Facilities.
AD-A106 890/7 1269

BAINES, THOMAS M.
Current Status of EPA Office of Mobile Source Air Pollution Control Characterization Projects: Summary.
PB82-105909 1269

Nitrosamines and Other Hazardous Emissions from Engine Crankcases.
PB82-127960 1210

BAINUM, P. M.
On the Shape and Orientation Control of an Orbiting Shallow Spherical Shell Structure.
N82-11100/6 1272

BAKER, A. L.
Materials Management in an Internationally Safeguarded Fuels Reprocessing Plant.
LA-8042(V.3) 1249

BAKER, C. C.
Toroidal Magnet System.
PATENT-4 263 096 1171

BAKER, J. G.
Coal Mine Labor Productivity: Mine-Level Data from Pike County, Kentucky, and Other Selected Counties.
ORAU-168 1166

BAKER, MERYL S.
Mathematics Curricula Requirements and Performance Levels in Navy Class 'C' Electronics Schools.
AD-A106 995/4 1106

BALADI, GILBERT Y.
The Resilient and Plastic Characteristics of Michigan Subgrade Soils and Their Soil Support Values.
PB82-109570 1170

BALAS, M. J.
Parameter Estimation of Large Flexible Aerospace Structures with Application to the Control of the Maypole Deployable Reflector.
N82-11099/0 1272

BALBACH, H. E.
Overview of Considerations in Assessing the Biomass Potential of Army Installations.
AD-A107 132/3 1266

BALEA, E.
Strange-Particle Cross Sections from Four-Prong pi exp - p Interactions at 16 GeV/C.
JINR-E-1-12345 1258

BALINT, V. S.
Corrosion Fatigue of Metals in Marine Environments.
AD-A107 247/9 1191

BALLOU, M. L.
Theory and Design of an Annual Cycle Energy System (ACES) For Residences.
ORNL/CON-43 1201

BALSHAW, KATHY M.
Marine Sediment Core Descriptions IWSOE 68, 69, 70; Deep Freeze 79,
PB82-132127 1158

BALYA, E.
Xi exp 0 Hyperon in the pi exp - p Interactions at 16 GeV/C.
JINR-R-1-11654 1258

BANDY, S.
Integrated Balanced FETs for Broadband Millimeter Wave Amplifiers.
AD-A107 526/6 1171

BANE, JOHN M. JR.
Synoptic Observations of the Three-Dimensional Structure and Propagation of Gulf Stream Meanders Along the Carolina Continental Margin.
AD-A107 226/3 1156

BAR-ILAN, A.
Energy Savings by Means of Fuel-Cell Electrodes in Electro-Chemical industries. Progress Report, February 1, 1981-April 30, 1981.
DE81030975 1185

BARAN, ROBERT S.
Overview of Considerations in Assessing the Biomass Potential of Army Installations.
AD-A107 132/3 1266

BARAONA, C. R.
Solar Cell Development for the Power Extension Package.
N82-11551/0 1187

BARENGOLTZ, J. B.
A Proposed New Policy for Planetary Protection.
N82-11095/8 1272

BARGER, A. CLIFFORD
Power Spectrum Analysis of Heart Rate Fluctuation: A Quantitative Probe of Beat-to-Beat Cardiovascular Control.
AD-A106 978/0 1142

BARKER, T. G.
Seismological Discrimination and Yield Determination Research.
AD-A107 360/0 1168

The Underwater Acoustic Signature of a Nuclear Explosion at the Ocean Surface.
AD-A107 359/2 1241

BARLOW, J. W.
Miscible Polymer Blends Based on Polycarbonate and a Copolyester.
AD-A107 389/9 1195

BARNES, B. D.
Mixing Water and Maturity of Hardened Concrete Using Scanning Electron Microscope Techniques. Part One.
PB82-133729 1220

BARNES, B. K.
Data Acquisition and Control for gamma Scanning.
LA-UR-80-1358 1241

BARNES, J. M.
Calculation of Neutron and gamma Ray Energy Spectra for Fusion Reactor Shield Design: Comparison with Experiment.
ORNL/TM-7360 1240

BARNES, KIMBERLY A.
Engineering - Economic Analysis of Improved Heat Pump Performance for Minimum Standards Development.
PB82-133810 1202

BARNETT, BRIAN
An Assessment of Wetland Habitat Establishment at a Central Florida Phosphate Mine Site.
PB82-130808 1211

BARNETT, JANE
A Survey of CODASYL Query Languages.
PB82-136763 1176

BARNEY, G. C.
Control of Building Engineering Services. Part 1: Background,
PB82-134669 1092

Control of Building Engineering Services. Part 2: A Survey of Proprietary Automation Systems,
PB82-134677 1092

Control of Building Engineering Services. Part 3: A Proposal for a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134685 1092

Control of Building Engineering Services. Part 4: Hardware Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134693 1092

Control of Building Engineering Services. Part 5: Software Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134701 1092

Control of Building Engineering Services. Part 6: Survey of the Control Systems Centre's Building Engineering Services,
PB82-134719 1092

BARR, DONALD R.
Estimation of Sensor Detection Probabilities with Data from Concurrent Sensors.
AD-A107 443/4 1178

BARR, G. E.
Disruption Scenarios for a Nuclear-Waste Repository on the Nevada Test Site.
DE81030844 1243

BARRETT, D. L.
Preparation of Large-Diameter GaAs Crystals.
AD-A107 395/6 1252

BARRON, WILLIAM F.
BIGMAC: Basic Interactive Geothermal Model with Aquifer Characterization; A User's Guide,
PB82-128679 1183

BARRY, P. J.
Hydrogeological and Geochemical Studies in the Perch Lake Basin. A Second Report of Progress.
AECL-6404 1157

BART, PAUL J.
Selective Inquiry System/Timesharing Retrieval Subsystem.
AD-A107 299/0 1173

BARTHOLD, W. P.
Optimization of Radially Heterogenous 1000-MW(E) LMFBR Core Configurations. Appendix C. Research Project 620-25.
EPRI-NP-1000(V.3) 1247

BARTINE, D. E.
Interim Assessment of the Denatured exp 233 U Fuel Cycle: Feasibility and Nonproliferation Characteristics.
ORNL-5398(Exec.Sum.) 1248

BARTLETT, RODNEY J.
Formaldehyde: Electronic Structure Calculations for the S(0) and T(1) States.
AD-A107 016/8 1148

BARTMAN, F. L.
Time-Variable Earth's Albedo Model Characteristics and Applications to Satellite Sampling Errors.
N82-11723/5 1085

BARTOSEVICH, JOSEPH F.
2-Acetylpyridine Thiosemicarbazones. 3. Selenium Analogs as Potential Antimalarial Agents.
AD-A106 958/2 1141

BASESCU, N.
Alaska: A Guide to Geothermal Energy Development.
DOE/ET/28476-T2 1162

BASILIO, OSCAR HERNANDEX
Design of Concrete Walls with Shear Failure (Diseno de Muros de Concreto Con Falla Por Cortante),
PB82-135385 1226

BATCH, R. V.
Optimization of Radially Heterogenous 1000-MW(E) LMFBR Core Configurations. Appendix C. Research Project 620-25.
EPRI-NP-1000(V.3) 1247

BATCHER, K. E.
SAR Processing on the MPP.
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BATES, E. F.
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DE82000421 1247

BATES, S. C.
High-beta Studies with Beam-Heated, Non-Circular Plasmas in ISX-B.
DE81032003 1239

BATTEN, ROSEMARY
Treatability Studies of Pesticide Manufacturing Wastewaters: Ethylenebisdithiocarbamate Fungicides.
PB82-107566 1210

BATYUNYA, B. V.
Comparison of Charged Particle Multiplicity Distributions in p Tilde p and Pp Interactions and Verification of the Dual Unitarization Scheme.
JINR-E-1-12306 1258

BAUER, JAY W.
Effects of Time-Varying Noise on Annoyance: A Review,
PB82-133513 1112

BAVARSKY, A.
Machine Intelligence Research Applied to Industrial Automation.
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BAXMAN, C. I.
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Applied Nuclear Data Research and Development. Progress Report, October 1-December 31, 1979.
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BAXTER, S. M.
Acoustic Model Power Distribution in a Duct at High Frequencies.
PB82-139064 1229

BAZAZYAN, G. G.
Participation of the Hypophyseal-Adrenal Cortex System in Thrombin Clearance During Immobilization Stress.

PERSONAL AUTHOR INDEX

N82-11760/7 1144

BEALL, P. T.
Biophysics of Water: A Working Conference.
AD-A107 336/0 1120

BEAN, THEODORE T.
On the Design of Simulations of Command and Control Processes.
AD-A107 423/6 1108

Some Guidelines for Effective Task Design in Command and Control Simulations.
AD-A107 424/4 1108

BEASLEY, W. D.
Wind-Tunnel Results for a Modified 17-Percent-Thick Low-Speed Airfoil Section.
N82-11033/9 1076

BEATTIE, J. A. C.
A True Air Speed Sensor for Miniature Unmanned Aircraft.
AD-A106 967/3 1079

BECHTEL, ROBERT B.
Post Occupancy Evaluation of Housing.
PB82-144296 1115

BECKER, ALBERT B. JR.
National Dam Safety Program. Crancer Lake Dam (MO 10764), Missouri - Kansas City Basin, Warren County, Missouri. Phase I Inspection Report.
AD-A107 353/5 1205

BECKER, J. J.
Investigation for Low-Cost Permanent Magnets.
AD-A107 392/3 1171

BECKETT, DAVID C.
Report of an Amphipod Species New to Ohio: 'Gammarus minus' Say (Amphipoda: Gammaridae).
PB82-132457 1121

BEGG, L. L.
Jet Impingement Heat Transfer Enhancement for the GPU-3 Stirling Engine.
N82-11993/4 1271

BEGGS, W. C.
Radiation Testing of Composite Materials, in Situ Versus Ex Situ Effects.
N82-11116/2 1190

BEHRENS, R. G.
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LA-UR-80-1252 1190

BEISEL, RICHARD
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BEJMA, THOMAS C.
Final Results of the 'One Week Follow-Up' with Participants during the FY79 and FY80 Emission Factor Testing Programs.
PB82-139494 1222

BELAK, M.
Electron Microscopical and Histochemical Studies on the Transverse Striated Muscles of Birds after Prolonged Hypokinesis.
N82-11759/9 1144

BELL, M. A.
Thermal Energy Storage Systems. Part I.
PB82-137589 1188

BELLES, ROGER G.
Water-Resources Information for the Withlacoochee River Region, West-Central Florida.
AD-A106 929/3 1159

BENAGE, J. F. JR.
Rf Field Effects on the Cyclotron Arc Source.
DE81030972 1257

BENDER, E. K.
Railroad Yard Simulation Model: Description and Computer Program Users' Manual.
PB82-138686 1222

BENENSON, P.
Utility Solar Finance: Economic and Institutional Analysis.
LBL-9959 1098

BENESH, FRANK H.
Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume V: Public Regulation,
PB82-144361 1100

BENKOVITZ, C.
Radioactive Materials Released from Nuclear Power Plants.
NUREG/CR-2227 1246

BENNETT, HERBERT S.
Upper Limits for the Number of Bound States Associated with the Yukawa Potential,
PB82-140625 1261

BENNIK, F. D.
Application of Tactical Data Systems for Training. Volume IV. Development of Courseware and Analysis of Results for GED Math.
AD-A107 530/8 1109

BENT, GARY D.
Formaldehyde: Electronic Structure Calculations for the S(0) and T(1) States.
AD-A107 016/8 1148

BERCHANU, SH.
Xi exp 0 Hyperon in the pi exp - p Interactions at 16 GeV/C.
JINR-R-1-11654 1258

BERG, ROBERT J.
Jamaica Feeder Roads: An Evaluation.
PB82-133802 1213

BERGE, L. H.
Gas Levitator and Method for Containerless Processing.
PAT-APPL-6-297 486 1224

BERGERON, MARCEL P.
Effect of Irrigation Pumping on the Ground-Water System in Newton and Jasper Counties, Indiana.
PB82-137688 1081

BERGGREEN, RICHARD G.
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BERGIN, JOHN M.
High Solitary Waves in Water: A Refined Numerical Method.
AD-A107 041/6 1156

BERGIN, KATHLEEN
Project Lame 80F: A Cultural Resource Survey Around Boulder Beach, Echo Bay, Temple Bar and Cottonwood Cove in the Lake Mead National Recreation Area Clark County, Nevada and Mohave County, Arizona,
PB82-109364 1104

BERGSTROM, S. L.
A Proposed New Policy for Planetary Protection.
N82-11095/8 1272

BERMAN, D.
Magnetic Field Satellite (MAGSAT) Data Processing System Specifications.
N82-11103/0 1174

BERMAN, JONATHAN D.
In vivo and in vitro Localization of Leishmania within Macrophage Phagolysosomes: Use of Colloidal Gold as a Lysosomal Label.
AD-A106 956/6 1122

BERNARD, H. RUSSELL
Informant Accuracy in Social Network Data V: An Experimental Attempt to Predict Actual Communication from Recall Data.
PB82-131210 1112

BERNHARDT, ARTHUR D.
Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume II. The Mobile Home Production System,
PB82-144338 1100

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume III: The Mobile Home Distribution System,
PB82-144346 1100

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume IV: The Mobile Home Park System,
PB82-144353 1100

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume V: Public Regulation,
PB82-144361 1100

BERRY, L. G.
Research on Noneconomic Factors Relevant to the Diffusion of Solar Total Energy Systems.
ORNL/TM-7297 1183

BERRY, W. E.
Influence of Cyclic Load and Environmental Effects on Stress Corrosion Cracking of Sensitized Stainless Steel. Final Report.
DE81904216 1192

BERSILLON, O.
Evaluation of the Capture Cross Section of exp 169 Tm from 10 exp -5 EV to 2.10 exp 7 EV.
CEA-CONF-4469 1257

BERSON, B. L.
Aircraft Alerting Systems Standardization Study. Volume I. Candidate System Validation and Time-Critical Display Evaluation.
AD-A107 225/5 1079

BERTSCHE, W. R.
Aids to Navigation Principal Findings on the CAORF Experiment. The Performance of Visual Aids to Navigation as Evaluated by Simulation.
AD-A107 045/7 1236

Simulator Evaluation of Electronic Radio Aids to Navigation Displays, the RA-1 Experiment.
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BETHEA, EDWIN A.
A Wooden Energy Demonstration Center in Alabama. Phase I: A Background Investigation.
PB82-134271 1082

BETHUNE, D. S.
Time-Resolved Infrared Study of Bimolecular Reactions between Tert-Butly Radicals.
AD-A107 154/7 1148

BETTS, MARTIN B.
Planning Amphibious Lift Forces. Appendix. Amphibious Ship Capacity Handbook.
AD-A106 949/1 1224

BEVILACQUA, NICHOLAS D.
Proposition 13 Research Inventory: A Partial Inventory of Research in the State of California and Elsewhere,
PB82-144429 1216

BEYERLEIN, A. L.
In-Process Inventory Estimation for Pulsed Columns and Mixer-Settlers.
LA-UR-80-741 1248

BEZDJIAN, KRIKOR A.
Development of Microfabrication Techniques.
AD-A107 128/1 1222

BHARUCHA-REID, A. T.
Weak Compactness of Solution Measures Associated with Random Equations.
AD-A107 144/8 1197

BHATTACHARYYA, ANJAN
Theoretical and Experimental Investigation of the Dynamics of Pulsed Laser Annealing of Amorphous Silicon.
AD-A106 855/0 1262

BHOGAL, MANMOHAN S.
Trypanosoma congolense: Natural and Acquired Resistance in the Bovine.
AD-A106 952/5 1122

BIASE, D. VINCENT
Advancement in Drug Free Therapeutic Community Treatment.
PB82-132796 1114

BICKELHAUPT, R. E.
Improvement of Hot-Side Precipitator Performance with Sodium Conditioning--An Interim Report.
PB82-134107 1213

BICKLER, T. C.
Synthetic Aperture Radar Target Simulator.
PAT-APPL-6-284 287 1238

BIDDLECOMBE, C. S.
COMPUMAG: Papers Presented by Members of the Laboratory at the Conference of the Computation of Electromagnetic Field, Chicago, 14-17 September, 1981,
PB82-134164 1253

BIEDERMAN, B.
Myeloproliferative Disorder with Unusual Marrow Chromosome Constitution.
AD-A107 206/5 1123

BIERSNER, ROBERT J.
Comparisons of Performance Effectiveness Among Divers.
AD-A106 912/9 1106

BIESTERFELDT, R. C.
Biomass in Southeastern Forests.
PB82-133422 1082

BILLS, TERRY D.
Biological Activity and Chemical Characteristics of Dredge Material from 10 Sites on the Upper Mississippi River,
AD-A107 276/8 1135

BILZI, PAUL
Technical and Economic Evaluation of Mine Closure Procedures.
PB82-136995 1167

BINGHAM, F. W.
Disruption Scenarios for a Nuclear-Waste Repository on the Nevada Test Site.
DE81030844 1243

BINKLEY, KENNETH M.
Excavation of Eleven Archaic and Woodland Sites in the Divide-Cut Section of the Tennessee-Tombigbee Waterways, Tishomingo County, Mississippi.
AD-A107 143/0 1103

BIRDSALL, C. K.
Plasma Theory and Simulation.
AD-A107 467/3 1260

BIRINYI, ANNE E.
Chronology of Cable Television Regulation: 1947 - 1978,
PB82-129032 1235

BIRKEMEIER, WILLIAM A.
Fast, Accurate Two-Person Beach Surveys.
AD-A107 285/9 1157

BISCHEL, WILLIAM K.
Two-Photon Laser-Induced Fluorescence in Oxygen and Nitrogen Atoms.
AD-A107 017/6 1148

BISER, LLOYD C.
Cooperative Farm Machinery Operations: Oregon and Wisconsin,
PB82-134123 1080

BISHNOI, P. RAJ
Kinetics of Gas Hydrate Formation. Part I: Kinetics of Ethane Gas Hydrate Formation. Part II: Kinetics of Natural Gas Hydrate Formation.
PB82-138868 1153

BISHOP, R. C.
Coal Mine Labor Productivity: Mine-Level Data from Pike County, Kentucky, and Other Selected Counties.
ORAU-168 1166

BLAAUWENDRAAD, J.
Concrete Mechanics. Part C. Numerical Models for Reinforced Concrete Structures in Plane Stress,
PB82-132721 1219

BLACKWELDER, RON F.
Hot-Wire and Hot-Film Anemometers.
AD-A107 213/1 1228

BLAIR, L. M.
Coal Mine Labor Productivity: Mine-Level Data from Pike County, Kentucky, and Other Selected Counties.
ORAU-168 1166

BLAISDELL, GEORGE L.
A Macroscopic View of Snow Deformation under a Vehicle.
AD-A107 038/2 1169

BLAXALL, MARTHA O.
Physicians and Financial Incentives,
PB82-133695 1132

BLEIWEIS, P. B.
TRAC Posttest Calculations of Semiscale Test S-06-3.
LA-UR-80-716 1247

BLISCHKE, WALLACE R.
Applications of Renewal Theory in Analysis of the Free-Replacement Warranty.
AD-A107 086/1 1089

BLOOD, DAVID W.
Study of Meteorological Conditions Along Actual or Proposed Reentry Trajectories.
AD-A107 035/8 1273

BLOOM, E. E.
Tensile Properties and Microstructure of Helium-Injected and Reactor-Irradiated V-20 Ti.
DE81032005 1192

BLOOM, FREDERICK
Stability and Growth Estimates for Electric Fields in Nonconducting Dielectrics with Memory.
AD-A106 982/2 1263

BLOOM, PAUL N.
Marketing Practices in the Alcoholic Beverages Industry: Toward an Understanding of How Macro-Environmental Forces Shape Marketing Strategies in the Alcoholic Beverage Industry. A Supplement to Phases I and II,
PB82-138579 1100

BLOOMQUIST, R. G.
Alaska: A Guide to Geothermal Energy Development.
DOE/ET/28476-T2 1162
Proceedings of the Geothermal Symposium: Potential, Legal Issues, Economics, Financing.
DE81023998 1161

BLUESTONE, MAURA
Design of an Evaluation of PSRO Long-Term Care Review.
PB82-131616 1132

BLUM, ROBERT W.
Guidelines for Managing the Flow of Information in an Automated Battlefield Command and Control System.
AD-A107 297/4 1233

BODA, K.
Electron Microscopical and Histochemical Studies on the Transverse Striated Muscles of Birds after Prolonged Hypokinesis.
N82-11759/9 1144

BOENIG, H. J.
1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix F. 1-GWh Electrical System Design.
LA-7885-MS(V.7) 1188

BOGNER, FRED K.
Minimum Weight Design of Flat Sandwich Panels under Edgewise Compression Loads.
AD-A107 096/0 1226

BOGOLYUBSKII, I. L.
Comparative Investigation of the Stability of One-Dimensional and Spherical Symmetric Solitons of the Scalar Field with Self-Interaction Jsub(Mu)Jsup(Mu).
JINR-R-2-12232 1261

BOGUSLAVSKY, I. V.
Comparison of Charged Particle Multiplicity Distributions in p Tilde p and Pp Interactions and Verification of the Dual Unitarization Scheme.
JINR-E-1-12306 1258

BOHACHEVSKY, I. O.
Inertial Confinement Fusion Reactor Systems.
LA-UR-80-2499 1239

BOISE, WILLIAM B.
Technological Innovation and Problem-Solving in Local Government: An Assessment of Current Research Methods.
PB82-128620 1091
Technological Innovation and Problem-Solving in Local Government: An Assessment of Current Research Methods, Executive Summary.
PB82-128638 1091

BOLAND, J. S. III
Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236

BOND, GARY
Simulated Tank Anti-Armor Gunnery System (STAGS).
AD-A107 481/4 1251

BONNER, B. E.
Polarimeter for Protons Between 300 and 800 MeV.
LA-UR-80-1943 1241

BOOTH, HOWARD G.
Preliminary Estimates of Wind Power Potential at the Nevada Test Site.
PB82-127036 1183

BORCHARDT, KURT
The Exchange Network Facilities for Interstate Access (ENFIA) Interim Settlement Agreement: Using Governmentally Sanctioned Negotiating Processes to Coordinate Telecommunications Facilities and Services,
PB82-129099 1235

BORCHERS, ROBERT GEORGE
A Computational Study of the Modification of Raindrop Size Distributions in Subcloud Downdrafts.
AD-A107 262/8 1084

BOREK, ROBERT W.
AGARD Flight Test Instrumentation Series. Volume 13. Practical Aspects of Instrumentation System Installation,
AD-A107 355/0 1077

BOREN, CHRISTINE
Evaluation of the Program of Nursing Services,
PB82-136920 1134

BOREN, PATRICIA
Codebook for the Household Survey, Site I, Wave 3. Housing Assistance Supply Experiment,
PB82-144908 1119

BORREGO, J. M.
Low Temperature Growth and Electrical Characterization of Insulators for GaAs MISFETS.
N82-11959/5 1171

BORTHWICK, PATRICK W.
Initial Toxicological Assessment of Ambush, Bolero, Bux, Dursban, Fentrifanil, Larvin, and Pydrin: Static Acute Toxicity Tests with Selected Estuarine Algae, Invertebrates, and Fish.
PB82-137654 1145

BORTZ, S. A.
Materials Recycling: An Overview of the Mineral Waste Utilization Symposium (6th).
PB82-133828 1213

BOUCEK, G. P.
Aircraft Alerting Systems Standardization Study. Volume I. Candidate System Validation and Time-Critical Display Evaluation.
AD-A107 225/5 1079

BOULTER, J. F.
Image Segmentation with Color and Texture,
AD-A107 479/8 1173

BOURCIER, R. J.
A Fracture Limit Diagram for Determining Hydrogen Embrittlement of Sheet under Multiaxial Loading Conditions.
AD-A107 116/6 1191

BOUSH, G. MALLORY
A New Approach for the Control of Cockroaches Utilizing the Entomophilic Nematode DD-136 in Conjunction with Attractants.
AD-A107 458/2 1136

BOWEN, B. M.
Study of the Nocturnal Drainage Flow over a Sloping Plateau in North-Central New Mexico.
DE81028744 1087

BOWERS, W. D.
Effect of Low Potassium Diet on Rat Exercise Hyperthermia and Heatstroke Mortality.
AD-A107 006/9 1144

BOWMAN, M. G.
LASL Thermochemical Hydrogen Program Status on September 30, 1980.
LA-UR-80-2400 1268

BOWMAN, S. M.
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BOWMAN, W. W.
In-Situ High-Resolution gamma-Spectrometric Survey of Burial Ground-Monitoring Wells.
DE81030827 1245

BOWSER, WAYNE E.
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BOYCE, D. E.
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PB82-135542 1183

BOYD, D. A.
Stochastic Sun: Understanding the Intermittent Resource.
ORAU/IEA-80-10(M) 1182

BOYLE, JOHN EARL
ADPE Acquisition: The Acquisition of the Naval Postgraduate School Computer, A Case Study.
AD-A107 478/0 1090

BOYLE, W.
Space Shuttle Solid Rocket Booster Sting Interference Wind Tunnel Test Analysis.
N82-11040/4 1272

BOYNS, P. K.
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DE82000434 1246

BRAAE, M.
Multivariable Control of a Milling Circuit at East Driefontein Gold Mine,
PB82-128729 1166

BRADSHAW, ALVIN
A New High Pressure Equation of State for Seawater.
AD-A107 221/4 1168

BRAGGINS, T. T.
Preparation of Large-Diameter GaAs Crystals.
AD-A107 395/6 1252

BRAHOSKY, ALBERT E.
Design and Utilization of an Infrared Data Base for an Advanced Image Interpretation Facility.
AD-A107 529/0 1173

BRAUN, JOANNE
Isometric, Isotonic, and Isokinetic Torque Variations in Four Muscle Groups through a Range of Joint Motion,
AD-A107 324/6 1142

BRAUNSTEIN, J.
Molten Carbonate Fuel Cell Program. Progress Report for Period January 1-March 31, 1979: EMF And Temperature Relaxation in LiKCO sub 3 Tiles; Transference Cell Measurements.
ORNL/TM-7003 1187

BRAUNSTEIN, YALE M.
The Economic Impact of State Cable TV Regulation,
PB82-129016 1235
Executive Summary of Findings of the State Cable Television Regulation Project,
PB82-129040 1235

BREES, DALE W.
Design and Fabrication of Coanda Suppressor Flow Visualization Model,
AD-A107 436/8 1270

BREGMAN, HOWARD
An Approach to Selecting Panels of Experts,
PB82-139569 1110
The Delphi Technique: Analysis of Responses to a Survey of Children's Mental Health Services Development,
PB82-139577 1110

BREIDENBACH, STEVEN T.
Conceptual Development of a Preliminary LSO Carrier Landing Training Aid.
AD-A107 002/8 1107

BREITENBERG, MAUREEN A.
Consumer Representation in Standards Development: Literature Review and Issue Identification.
PB82-135880 1093

BREMER, SHIRLEY G.
Test Problems and Results for OMNITAB 80.
PB82-136474 1176

BRENDEN, JOHN J.
Fire Endurance Under Design Load for Walls of One-Story Three-Room Structures of Sandwich and Wood-Frame Construction,
PB82-144601 1227

BRENNEMAN, DALE
COBOL Structured Code Analyzer.
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BRESLOW, M.
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LA-8403-PR 1247

BRETT, DEBORAH
Urban Infill: Opportunities and Constraints.
PB82-144304 1216

BREWER, L.
Thermodynamic Data for Flue-Gas Desulfurization Processes.
DE81030545 1150

BRICKER, RODNEY P. G.
U.S. Technology Transfer to the Soviet Union: A Dilemma.
AD-A107 313/9 1090

BRICTSON, CLYDE A.
Conceptual Development of a Preliminary LSO Carrier Landing Training Aid.
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Development of a Computer Based Air Combat Maneuvering Range Debrief System. Volume I.
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BRIESEN, R. V.
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BRITT, E. J.
Jet Impingement Heat Transfer Enhancement for the GPU-3 Stirling Engine.
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BRITTENHAM, T. L.
Directional Drilling Equipment and Techniques for Deep Hot Granite Wells.
LA-UR-80-2086 1165

BROCKMAN, ROBERT A.
Finite Element Techniques for Static Stress and Free Vibration Analysis of Sandwich Composites.
AD-A107 095/2 1226

BRONFMAN, B. H.
Public Information on Radioactive Waste: A Study of an Emerging Issue.
ORNL/OIAPA-13 1245

BRONFMAN, L. M.
Public Information on Radioactive Waste: A Study of an Emerging Issue.
ORNL/OIAPA-13 1245

Research on Noneconomic Factors Relevant to the Diffusion of Solar Total Energy Systems.
ORNL/TM-7297 1183

BRONSTEIN, H. R.
Molten Carbonate Fuel Cell Program. Progress Report for Period January 1-March 31, 1979: EMF And Temperature Relaxation in LiKCO sub 3 Tiles; Transference Cell Measurements.
ORNL/TM-7003 1187

BROOKS, DAVID A.
Synoptic Observations of the Three-Dimensional Structure and Propagation of Gulf Stream Meanders Along the Carolina Continental Margin.
AD-A107 226/3 1156

BROOKS, R. L.
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BROUWERS, A. P.
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BROWN, A.
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BROWN, C. B.
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BROWN, M. G.
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BROWN, NESBITT D.
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BROWN, PHILIP F.
Financial Profile of 15 New Agricultural Marketing Cooperatives,
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BROWN, R. E.
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BROWN, R. P.
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BROWNING, ROBERT F.
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BRUNELLE, BILLY C.
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BRUNER, WILLIAM E.
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BRUNSMAN, M. D.
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BUCK, RICHARD F.
Development of Instrumentation for Research Probes.
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BUDDE, WILLIAM L.
Performance Tests for the Evaluation of Computerized Gas Chromatography/Mass Spectrometry Equipment and Laboratories,
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BUDDING, DAVID W.
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BUEL, V. E.
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BUFFAM, PAUL E.
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BUNKER, B. C.
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BUNYATOV, S. A.
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BURCHETT, R. R.
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BURCK, G. M.
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BURGESS, DONALD W.
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BURGESS, WILLIAM T.
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BURKE, H. H. K.
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BURKE, HSIAO-HUA K.
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BURKHART, L. E.
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BURKHEAD, JESSE
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BURNER, A. W.
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BURNS, R. A.
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BURROWS, ELIZABETH P.
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BURT, ROGER A.
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BURTON, EDWIN R.
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BUSH, C. E.
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BUSSEY, ALLAN J.
Study of Meteorological Conditions Along Actual or Proposed Reentry Trajectories.
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BUSSO, R. H.
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BUTLER, T. D.
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Spectral Estimation Technology.
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CAFARELLA, JOHN H.
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CAGGIANO, MICHAEL N.
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CAIN, A. B.
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CAL, ZINHAN
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CAMMARATA, STEPHANIE
AUTOPILOT: A Distributed Planner for Air Fleet Control.
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CAMPANA, J. E.
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CAMPANY, A. D.
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CAMPBELL, C.
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CAMPBELL, L. JANCIE
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CANALI, S.
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CANTLON, SCOTT
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CAO, WEIJI
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CARD, EMILY
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CARFAGNO, D. G.
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CARIMALO, C.
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CARLE, FRANK LOUIS
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CARLSON, CARL GLYNN
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CARNES, J. G.
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CARNEY, H. J.
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CARPENTER, EDWIN J.
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CARPENTER, WILLIAM M.
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Predictability of Dental Emergencies by Panography.
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CARROLL, STEPHEN J.
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CARROLL, W. L.
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CARTEN, ANDREW S. JR.
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CARTER, P. G.
Kielder Aqueduct Tunnels - Predicted and Actual Geology,
PB82-135302 1214

CASEY, STEPHEN C.
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PB82-144825 1118

CASHWELL, J. W.
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CATES, M. R.
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CECALA, ANDREW B.
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CERASOLI, C. P.
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CHA, SOYOUNG
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CHAI, Y.
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CHAKOUMAKOS, CHARLES
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CHALABI, MARGERY AL
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PB82-144304 1216

CHAMBERLAIN, EDWIN J.
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AD-A106 976/4 1204

CHAMIS, C. C.
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CHAN, K. S.
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CHAN, T.
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CHAN, VINCENT W.
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CHANG, C. A.
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CHANG, L. L.
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CHAO, K. -J.

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CHAPMAN, G. T.

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ORNL/TM-7360 1240

CHAPMAN, JAMIE

Maui Optical Tracking and Identification Facility Transition Program.
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CHARBUCINSKI, J.

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CHARNES, A.

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CHARNEY, ALBERTA H.

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CHASZAR, JOSEPH

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CHATTERJEE, J. S.

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CHATTERJEE, S. N.

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CHATTERTON, N. E.

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CHELNAYA, N. A.

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CHEN, C. H.

Geophysical Signal Recognition.
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CHEN, C. Y.

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AD-A106 913/7 1194

CHEN, CHEN-TUNG

The Carbonate System in the Western Mediterranean Sea.
AD-A107 390/7 1168

A New High Pressure Equation of State for Seawater.
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CHEN, CHEN-TUNG A.

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The Equation of State of D2O Determined from Sound Speeds.
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CHEN, J.

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CHEN, JOANNE HWA

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CHEN, PETER Y. S.

Energy Efficient Lumber Dry Kiln Using Collectors and Refrigeration System.
PAT-APPL-6-276 764 1196

CHEN, T. H.

Characterization of Pollutants at Holston Army Ammunition Plant.
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CHEN, YUXIA

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CHENEY, R. WAYNE

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PB82-139387 1161

CHERRY, J.

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CHERRY, J. T.

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CHESLER, S. N.

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CHETIRKIN, PETER V.

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CHIANG, TZE I.

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CHIEN, JAMES C. W.

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Soliton Formation and cis trans Isomerization in Polyacetylene.
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CHILTON, E.

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CHIONG, WINSTON

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CHITTINENI, C. B.

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CHOLLAR, BRIAN H.

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CHRISTENSEN, D. L.

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CHRISTENSEN, E. L.

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CHRISTOPHER, P. A. T.

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CHU, B.

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CHU, W. K.

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CHULAY, JEFFREY D.

Inhibition of in vitro Growth of Plasmodium falciparum by Immune Serum from Monkeys.
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CHUNG, T.-C.

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Photoconductivity in Polyacetylene.
AD-A106 965/7 1194

CHUNG, Y. T.

Modal Analysis Using a Fourier Analyzer, Curve-Fitting, and Modal Tuning.
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CHURCHWARD, VICTOR

National Waterways Study Overview of the Transportation Industry.
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CHYI, KWO-LING

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CIAVARELLI, A. P.

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CIAVARELLI, ANTHONY P.

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CIONI, J. L.

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CIRELLO, J.

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CLABAUGH, CARROLL ARDEE

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CLAGETT, J. L.

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CLARK, J. H.

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CLARK, J. P.

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CLARK, ROBERT M.

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CLARKE, EDMUND M.

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AD-A107 533/2 1173

CLARKE, T. C.

(13)C NMR of AsF5 Doped Polyacetylene.
AD-A107 167/9 1149

The Chemistry of Polyacetylene Doping.
AD-A107 165/3 1195

Preparation and Characterization of Neutral and Oxidized Polypyrrole Films.
AD-A107 166/1 1195

CLAROTTI, C. A.

Analysis of Complete Logical Structures in System Reliability Assessment.
PB82-138363 1242

CLAUS, R. O.

Optical Fiber Interferometer for the Study of Ultrasonic Waves in Composite Materials.
N82-11121/2 1191

CLEINO, ELIZABETH W.

The Community Mental Health Project: Pilot Project.

PB82-135252 1132

CLIFTON, D. G.
Status of exp 241 Am Recovery and Purification at Los Alamos Scientific Laboratory.
LA-UR-80-2414 1240

CLINE, M. C.
Computation of High Reynolds Number Internal/External Flows.
N82-11046/1 1254

CLOSE, D. A.
Low-Level Transuranic Waste Assay by Photon Interrogation and Moderated Neutron Counting.
LA-7857 1244

CLOUTMAN, L. D.
CONCHAS: An Arbitary Lagrangian-Eulerian Computer Code for Multicomponent Chemically Reactive Fluid Flow at All Speeds.
LA-8129-MS 1253

Numerical Simulation of Reactive Flow in Internal Combustion Engines.
LA-UR-80-1633 1271

COBB, D. D.
In-Process Inventory Estimation for Pulsed Columns and Mixer-Settlers.
LA-UR-80-741 1248

Materials Management in an Internationally Safeguarded Fuels Reprocessing Plant.
LA-8042(V.1) 1248

Materials Management in an Internationally Safeguarded Fuels Reprocessing Plant.
LA-8042(V.3) 1249

COBB, L. B.
Atlantic Coastal Plain Geothermal Test Holes, North Carolina. Hole Completion Reports.
NVO-1558-5(V.2) 1166

COCA, C.
Strange-Particle Cross Sections from Four-Prong pi exp - p Interactions at 16 GeV/C.
JINR-E-1-12345 1258

COCHRAN, C. N.
1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix B: Cost Study, High-Purity Aluminum Production.
LA-7885-MS(V.3) 1188

COELHO, CARLOS ALBERTO DIAS
Compensation of the Speed Governor of a Water Turbine by the Method of Inequalities,
PB82-136011 1224

COGAN, JAMES L.
Techniques for the Computation of Wind, Ceiling, and Extinction Coefficient Using Currently Acquired RPV Data.
AD-A107 094/5 1085

COHEN, J. B.
X-Ray Diffraction Study of Zr(Ca, Y)O sub 2-x; The Disordered State.
AD-A107 013/5 1252

COHEN, MORRIS A.
Optimal Control of a Network of Whole Blood Banks: Target Inventory Levels for a Hospital Blood Bank or a Decentralized Regional Blood Banking System.
PB82-106816 1130

COHEN, R. E.
Estimation of the Homogenization Temperature of a 1.2 Polybutadiene/1.4 Polybutadiene Diblock Copolymer Using Rheological Testing Methods.
AD-A107 069/7 1194

COHEN, S. H.
An Evaluation of the Spatial Resolution of Soil Moisture Information.
N82-11513/0 1170

COKE, JAMES
Case Studies of the Impact of Federal Aid on Major Cities: City of Cleveland.
PB82-131558 1114

COLE, J. D.
A Study of Wall Jets and Tangentially Blown Wings.
AD-A106 986/3 1077

COLE, JAMES T.
Development and Field Verification of a Model of House Air Infiltration for Single Family Residences.
PB82-141110 1226

COLE, WALTER E.
Monoterpenes of Lodgepole Pine Phloem as Related to Mountain Pine Beetles.
PB82-107293 1081

COLLINS, GARY C.
Approved Prescription Drug Products with Therapeutic Equivalence Evaluations.
PB82-129164 1141

COLLINS, R. V.
On-Site GC/MS Analysis of Chapman Gasification Separator Liquor.
PB82-107285 1152

COLLURA, JOHN
Finance Issues: County Highways and Public Transit,
PB82-128828 1091

COLWELL, R.
Users Manual for the US Baseline Corn and Soybean Segment Classification Procedure.
N81-29504/0 1080

COMPARATO, J. R.
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DE82000122 1265

CONDON, J. B.
Infrared and Structural Analyses of Uranium Oxidation Products: Preliminary Results.
DE82000233 1151

CONDON, P. E.
New Measurement Strategy for in Situ Testing of Wall Thermal Performance.
LBL-8822 1226

CONE, M. V.
Chemicals Identified in Human Biological Media.
DE81030813 1141

CONGALTON, R. G.
Nationwide Forestry Applications Program. Analysis of Forest Classification Accuracy.
N81-29499/3 1081

CONGDON, C. W.
Jet Impingement Heat Transfer Enhancement for the GPU-3 Stirling Engine.
N82-11993/4 1271

CONINE, B.
Space Shuttle Solid Rocket Booster Sting Interference Wind Tunnel Test Analysis.
N82-11040/4 1272

CONNOLLY, JOHN M.
Alert Aircraft Roll Over Chocks.
AD-A107 456/6 1079

CONRAD, DAVID M.
Joining the Defense Directives and Defense Acquisition Regulatory Systems,
AD-A107 142/2 1230

CONTE, M.
Meridional Heat Transport at the Onset of Winter Stratospheric Warming.
N82-11697/1 1085

CONTINI, S.
Analysis of Complete Logical Structures in System Reliability Assessment,
PB82-138363 1242

COOK, C. F. JR.
Synthesis, Radiation Degradation, and Electron Beam Resist Behavior of Fluorine-Containing Vinyl Polymers.
AD-A106 913/7 1194

COOK, D. H.
Station Blackout at Browns Ferry Unit One - Accident Sequence Analysis,
NUREG/CR-2182-V1 1248

COOK, P. A.
On the Behaviour of Dynamical Systems Subject to Bounded Disturbances,
PB82-135682 1199

COOPER, J.
An Analysis of Markovian Model Microfield Methods for Stark Broadening.
PB82-108044 1152

COOPER, R. B.
Simulator Evaluation of Electronic Radio Aids to Navigation Displays--The Miniexperiment.
AD-A107 072/1 1236

Simulator Evaluation of Electronic Radio Aids to Navigation Displays, the RA-1 Experiment.
AD-A106 941/8 1236

COOPER, W. W.
Evaluating Program and Mangerial Efficiency: An Application of Data Envelopment Analysis to Program Follow Through.
AD-A107 007/7 1089

CORCORAN, JOHN
Evaluation of Spatial Filtering as a Means for Increasing Optical Performance in High Power Beam Trains.
AD-A107 164/6 1256

CORLETT, R. C.
Kinetic Behavior of Subbituminous Coal Drying; Effects of Confining Pressure.
LA-UR-80-551 1165

CORNISH, S. J.
Myeloproliferative Disorder with Unusual Marrow Chromosome Constitution.
AD-A107 206/5 1123

CORNWELL, R. K.
Signal Analysis Van Hardware Operation General Description. Volume 1.
AD-A106 948/3 1238

COSME, G.
Hadronic Cross Sections Study in E exp + E exp - Collisions from 1.350 GeV to 2.125 GeV.
LAL-78-32 1260

COTTER, S. L.
Design Analysis for the Control and Drive Retrofit of a Numerically Controlled Lathe.
LA-UR-80-621 1224

COULTER, GEORGE A.
Shock Tube Tests of Muzzle Blast Transducers.
AD-A107 319/6 1251

COURTNEY, WILLIAM E.
A 31-GHz Monolithic GaAs Mixer/Preamplifier Circuit for Receiver Applications.
AD-A107 062/2 1178

COURY, G. E.
Evaporation by Mechanical Vapor Recompression. Technical Progress Report, April 1, 1980-June 30, 1980.
BSDF-38-3Q-80 1137

COVENEY, D. B.
Cutting Ice with High Pressure Water Jets--Translation.
AD-A106 985/5 1169

COWAN, MICHAEL S.
Colorado River Simulation System: An Executive Summary,
PB82-139387 1161

COX, K. E.
LASL Thermochemical Hydrogen Program Status on September 30, 1980.
LA-UR-80-2400 1268

COX, L. E.
ESCADT: A FORTRAN Code for Computing the Positions and Areas of X-Ray Photoelectron Spectral Peaks.
LA-7910 1263

COX, S. A.
Directional gamma Detector.
PATENT-4 259 575 1241

CRAIG, P. P.
Saving Half of California's Energy and Peak Power in Buildings and Appliances Via Long-Range Standards and Other Legislation.
LBL-6865 1182

CRAIG, R. R. JR.
Modal Analysis Using a Fourier Analyzer, Curve-Fitting, and Modal Tuning.
N82-11490/1 1262

CRAMER, JOHN P.
New Record of Introduced Hosts for the Mountain Pine Beetle in California.
PB82-134438 1082

CRANDELL, THOMAS L.
Technical Communication--Taking the User into Account.
AD-A107 030/9 1107

CRANE, ROBERT K.
Study of Meteorological Conditions Along Actual or Proposed Reentry Trajectories.
AD-A107 035/8 1273

CREDEUR, K. R.
Comparisons of Some Large Scientific Computers.
N82-11817/5 1174

CREIGHTON, J. R.
Effects of Gas-Flow Pattern on Cavity Shape.
DE82000347 1161

CRISP, CARL E.
Field Evaluation of Phloem-Mobile Acephate for Suppression of Southern Pine Beetle.
PB82-134479 1082

CROMMELYNCK, D.
Radiation Balances and the Solar Constant.
N82-12016/3 1085

CROSLEY, DAVID R.
Two-Photon Laser-Induced Fluorescence in Oxygen and Nitrogen Atoms.
AD-A107 017/6 1148

CROSS, AMY
Atmospheric Benzene Depletion by Soil Microorganisms.
PB82-126293 1170

CROSS, RALPH D.
Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume I,
PB82-131426 1211

Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume II,
PB82-131434 1211

CROWE, DAVID A.
Ultra-Lightweight Mirror Manufacturing and Radiation Response Study.
AD-A106 998/8 1222

CROWELL, C. R.
Impact Ionization and Hot Carrier Transport in Semiconductors.
AD-A107 386/5 1263

CROWLEY, C. J.
1/5-Scale Countercurrent Flow Data Presentation and Discussion.

PERSONAL AUTHOR INDEX

NUREG/CR-2106 1248

CULBERT, T. P.
Radar Mapping, Archaeology, and Ancient Land Use in the Maya Lowlands.
N82-11514/8 1104

CUNEO, ANDREW A. JR.
Scale Modeling for the PATRIOT Electromagnetic Pulse Test.
AD-A107 480/6 1232

CUNNINGHAM, S. W.
SPAR Data Set Contents.
N82-11816/7 1273

CURRAN, EDWARD T.
An Investigation of Flame Stability in a Coaxial Dump Combustor.
AD-A107 256/0 1264

CURTIS, L. J.
Search for Promethium-Like Gold Lines and Other Transitions of Interest to Fusion Research.
DE81029917 1239

CURTIS, P. T.
A Basic Computer Program to Calculate Moisture Content in Resins and Fibre Reinforced Resin Composites.
AD-A106 970/7 1194

CYBROWSKI, W. J.
Application of Digital Troposcatter to the DCS.
AD-A107 303/0 1234

CYMERMAN, A.
Prediction of Energy Expenditure during Load Carriage at High Altitude.
AD-A106 852/7 1143

CZYRYCA, E. J.
Dynamic J sub I-R Curve Testing of HY-130 Steel.
AD-A107 040/8 1191

DA ROSA, A. P. A. TRAVASSOS
A Multidisciplinary Program of Infectious Disease Surveillance along the Transamazon Highway in Brazil: Epidemiology of Arbovirus Infections.
AD-A107 008/5 1123

DA ROSA, J. F. TRAVASSOS
A Multidisciplinary Program of Infectious Disease Surveillance along the Transamazon Highway in Brazil: Epidemiology of Arbovirus Infections.
AD-A107 008/5 1123

DABBERDT, WALTER F.
Analyses, Experimental Studies, and Evaluations of Control Measures for Air Flow and Air Quality on and Near Highways. Volume I: Experimental Studies, Analyses, and Model Development.
PB82-133604 1213

DABBY, D.
Fuel Utilization Improvements in a Once-Through PWR Fuel Cycle. Final Report on Task 6.
ORNL/SUB-7494/3 1248

DAFOE, CAMERON G.
Cerebral Economics: Resource Competition within but not Between Hemispheres.
AD-A107 362/6 1112

DAGAZIAN, R. Y.
Resistive G-Modes and Ballooning.
LA-UR-80-738 1261

DAGENHART, J. R.
Amplified Crossflow Disturbances in the Laminar Boundary Layer on Swept Wings with Suction.
N82-11391/1 1078

DAHLGREN, DAVID
Chemisorption and Thermal Chemistry of Azulene and Naphthalene Adsorbed on Pt(III).
AD-A107 068/9 1148

The Nature of the Phase Transition Observed for Monolayers of Azulene on Pt(iii).
AD-A107 067/1 1148

Symmetry Extinction of LEED Beams for Naphthalene Adsorbed on Pt(iii).
AD-A106 963/2 1148

DALY, B.
Research and Development: Systems for Transmitting Energy Through the Intact Skin.
PB82-129321 1142

DAMIEN, D. A.
Magnetic Susceptibility of Curium Pnictides.
DE82000148 1263

DAMLER, PATRICIA ANN
Fathering and the Pediatric Cancer Experience.
AD-A106 945/9 1122

DANA, STEPHANE S.
Development of Microfabrication Techniques.
AD-A107 128/1 1222

DANIEL, J. HARRISON
The Water Spray Cooler - An Update.
PB82-135724 1167

DANIELS, G.
Trial of a Computer Generated Travel Information System in Two British Rail Travel Enquiry Bureaux,
PB82-135781 1096

DANNER, WILLIAM F.
Effects of Time-Varying Noise on Annoyance: A Review,
PB82-133513 1112

DANOS, MICHAEL
Model for the Hadron-Hadron Vertex: Dynamic Origin of the OZI Rule.
PB82-137381 1260

DARBAIDZE, YA. Z.
Deep Inelastic Lepton-Nucleus Scattering.
JINR-E-2-12127 1258

DAS, P.
Hot-Carrier Microwave Conductivity in the Non-Zero Collision Duration Regime.
AD-A107 120/8 1263

DASSE, K.
Research and Development: Systems for Transmitting Energy Through the Intact Skin.
PB82-129321 1142

DATO, P. ACTIS
Description and Performance of an Active Solar Cooling System, Using a LiBr-H2O Absorption Machine,
PB82-139031 1202

DATTA, S. K.
Anisotropic Elastic Constants of a Fiber-Reinforced Boron-Aluminum Composite.
PB82-134016 1191

DAVIES, T. D.
Statistical Validity for Electron Probe Microanalysis of Organic Sulfur in Coal.
LA-UR-80-585 1228

DAVIES, T. P.
Kielder Aqueduct Tunnels - Predicted and Actual Geology,
PB82-135302 1214

DAVIS, C. G.
Comparison of a Drainage Flow Model with the Data of Manins and Sawford.
DE81025366 1087

DAVIS, FRANCES M.
GaAs Shallow-Homojunction Solar Cells on Ge-Coated Si Substrates.
AD-A107 056/4 1184

DAVIS, J.
Peat Resource Evaluation: State of Maine. Report for the Quarter Ending August 1981.
DE82000227 1157

DAVIS, J. E.
Methyl Parathion Persistence in Soil Following Simulated Spillage.
PB82-127549 1170

DAVIS, S. H.
Surface-Tension Induced Instabilities: Effects of Lateral Boundaries.
N82-11390/3 1262

DAVIS, SUSAN B.
Marine Sediment Core Descriptions IWSOE 68, 69, 70; Deep Freeze 79,
PB82-132127 1158

DAVY, B.
'Pseudo', A Macro-Based High Level Language for the PDP-11,
AD-A107 168/7 1172

DAWLESS, R. K.
1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix B: Cost Study, High-Purity Aluminum Production.
LA-7885-MS(V.3) 1188

DAWSON, VERDEL K.
Biological Activity and Chemical Characteristics of Dredge Material from 10 Sites on the Upper Mississippi River,
AD-A107 276/8 1135

DAWSON, W. K.
MBD Diagnostics.
LA-8435-MS 1173

DAY, G. W.
Measurement of Optical Fiber Bandwidth in the Frequency Domain.
PB82-135179 1256

DAYEM, H. A.
Materials Management in an Internationally Safeguarded Fuels Reprocessing Plant.
LA-8042(V.1) 1248

DE CRESPIN DE BILLY, L.
Meson F sub 1 Spin and Parity Measurement.
LPNHEP-T-78-01 1260

DE FREITAS, V. L. B.
Control of Building Engineering Services. Part 1: Background,
PB82-134669 1092

Control of Building Engineering Services. Part 2: A Survey of Proprietary Automation Systems,
PB82-134677 1092

Control of Building Engineering Services. Part 3: A Proposal for a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134685 1092

Control of Building Engineering Services. Part 4: Hardware Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134693 1092

Control of Building Engineering Services. Part 5: Software Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134701 1092

Control of Building Engineering Services. Part 6: Survey of the Control Systems Centre's Building Engineering Services,
PB82-134719 1092

On-Lining an SDK-85 Microcomputer with a DEC System 10 for Down-Line Loading of Microcomputer Programs,
PB82-134776 1176

DE GROOT, A. K.
Concrete Mechanics. Part B. Numerical Modelling of Bond-Slip Behaviour,
PB82-132713 1219

General Derivation of Hardening Formulas,
PB82-132937 1219

DE JONGH, A. W.
A Simplified Approach to Creep Buckling and Creep Instability of Steel-Concrete Columns,
PB82-132945 1219

DE SAUSSURE, G.
Comparison of the ENDF/B-V and SOKRATOR Evaluations of exp 235 U, exp 239 Pu, exp 240 Pu and exp 241 Pu at Low Neutron Energies.
DE81032037 1258

DEA, J. Y.
Improved Constant-Output Atomizer.
PAT-APPL-6-308 203 1225

DEASON, G. A.
Carbon Dioxide Absorption Characteristics of High Performance Sodasorb at 1 Atmosphere.
AD-A107 488/9 1140

DECKER, REY S.
National Dam Safety Program. MO Noname 27 Dam (MO 10353), Missouri - Nemaha - Nodaway Basin, Holt County, Missouri. Phase I Inspection Report.
AD-A107 540/7 1208

DEINER, ALBERT
Evaluation of Replacement Red Smoke Dyes for 1-N Methylaminoanthraquinone.
AD-A107 286/7 1190

DEL CID, L.
Non-Contacting Suspension and Propulsion Systems for Transportation Applications,
PB82-135591 1221

DELHEIJ, P. P. J.
Polarized Targets and Polarized Low Energy Neutrons at WNR.
LA-UR-80-1933 1242

DEMBERT, MARK L.
Comparisons of Performance Effectiveness Among Divers.
AD-A106 912/9 1106

DEMENT, JOHN
Asbestos Dust and Preliminary Industrial Hygiene Survey at World-Bestos, the Firestone Tire and Rubber Company in New Castle, Indiana.
PB82-107178 1139

DEMUTH, J. E.
Lifetime Broadening of Excited Pyrazine Adsorbed on Ag(111).
AD-A106 854/3 1148

DENENSTEIN, A.
Inter-Soliton Electron Hopping Transport in Trans-(CH)x.
AD-A106 966/5 1263

DENNIS, T. B.
The Multicategory Case of the Sequential Bayesian Pixel Selection and Estimation Procedure.
N81-29498/5 1198

DENSON, KEITH H.
Wave Forces on Causeway-Type Coastal Bridges: Effects of Angle of Wave Incidence and Cross-Section Shape.
PB82-131657 1211

DEPASO, DIANE
Evaluation of Formaldehyde Problems in Residential Mobile Homes.
PB82-144619 1136

DERBY, CHARLES D.
Influence of Drilling Muds on the Primary Chemosensory Neurons in Walking Legs of the Lobster, 'Homarus americanus'.
PB82-128190 1136

DERMODY, PHILLIP M.
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AD-A107 507/6 1237

DEROECK, DAN
Permit Fee Guideline.
PB82-107871 1210

DERSHOWITZ, W.
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LBL-10839 1166

DESILETS, B. H.
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LA-7921-PR 1244

DESJEUX, JEHAN-F.
Antisecretory Effects of Berberine in Rat Ileum.
AD-A106 953/3 1141

DEVANEY, J. J.
First Wall Magnetic Protection in an Inertially Confined Thermonuclear Reactor.
LA-8286-MS 1240

DEW, C. BRAXTON
Susquehanna River Anadromous Fish Studies, Conowingo Dam to Havre De Grace, Maryland.
PB82-135963 1121

DEWART, J. M.
Study of the Nocturnal Drainage Flow over a Sloping Plateau in North-Central New Mexico.
DE81028744 1087

DHURIA, H.
Computation of Averaged Monthly Zonal Albedo Utilizing the Solar Zenith Angle, Properties of Clear and Cloudy Atmospheres.
N82-12010/6 1082

DI PIANO, MICHAEL T.
Muzzle Flow in the Presence of an Anti-Recoil Plate: Exploratory Study.
AD-A107 314/7 1251

DIBBERN, VICTORIA
Nutrition Research--USSR,
AD-A107 335/2 1137

DIBENEDETTO, THOMAS R.
Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume IV: The Mobile Home Park System,
PB82-144353 1100

DIBENEDITTO, JOSEPH PETER
Automatic Microwave Network Analyzer Calibration by Reference to a Transmission-Line Standard with Applications to Characterization of Adapters, Devices, and Coaxial Lines with SMA Connectors.
AD-A107 198/4 1227

DICKENS, BRIAN
User's Manual for Factor-Jump Thermogravimetry Apparatus, and Associated Programs, Including a General Plotting Program,
PB82-109851 1229

DICKERSON, M. H.
Overview, Current Status, and Future Plans for the DOE Atmospheric Studies in Complex Terrain (ASCOT) Program.
DE81024417 1086

DICKSON, D. BRUCE JR.
Cultural Resources Investigations at Redstone Arsenal, Madison County, Alabama. Volume I.
AD-A107 151/3 1103

Cultural Resources Investigations at Redstone Arsenal, Madison County, Alabama. Volume II.
AD-A107 152/1 1103

DICOCCO, JOHN B.
Acceptance Sampling of Steel Reinforcing Bars.
PB82-135690 1220

DIETZ, R. J.
Materials Management in an Internationally Safeguarded Fuels Reprocessing Plant.
LA-8042(V.1) 1248

DIETZ, R. N.
Perfluorocarbon Vapor Tagging of Blasting Cap Detonators.
PATENT-4 256 038 1250

DIGGS, CARTER L.
Inhibition of in vitro Growth of Plasmodium falciparum by Immune Serum from Monkeys.
AD-A106 960/8 1122

Trypanosoma congolense: Natural and Acquired Resistance in the Bovine.
AD-A106 952/5 1122

DISERENS, N. J.
COMPUMAG: Papers Presented by Members of the Laboratory at the Conference of the Computation of Electromagnetic Field, Chicago, 14-17 September, 1981,
PB82-134164 1253

DIXON, KENNETH E.
A Multidisciplinary Program of Infectious Disease Surveillance along the Transamazon Highway in Brazil: Epidemiology of Arbovirus Infections.
AD-A107 008/5 1123

DOCTOR, BHUPENDRA P.
Determination of N-Methyl Pyridinium-2-Aldoxime Chloride and Its Hydrolytic By-Products by Ion-Pair High-Performance Liquid Chromatography.
AD-A106 962/4 1141

DODSON, D. J.
Surface Acoustic Wave Microwave Oscillator and Frequency Synthesizer.
AD-A107 539/9 1178

DODSON, HELEN W.
Evolutionary Charts of Solar Activity (Calcium Plages) as Functions of Heliographic Longitude and Time 1964-1979,
PB82-130774 1083

DOMACK, EUGENE W.
Marine Sediment Core Descriptions IWSOE 68, 69, 70; Deep Freeze 79,
PB82-132127 1158

DOMEN, STEVE R.
The Graphite Calorimeter as a Standard of Absorbed Dose for Cobalt-60 Gamma Radiation,
PB82-140617 1241

DONALDSON, RALPH J. JR.
Attenuation Problems Associated with a 5 cm Radar.
AD-A107 215/6 1238

DONETS, E. D.
JINR Synchrophasotron Operation and Improvement (The Second Quarter of 1978).
JINR-9-11990 1257

DONNELLY, JOSEPH P.
Transient Annealing of Arsenic-Implanted Silicon Using a Graphite Strip Heater.
AD-A107 230/5 1222

DONNOHUE, MICHAEL
Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
PB82-107210 1139

DORFMUELLER, TH.
Photon Correlation Spectroscopy of Bulk Siloxane Polymers.
AD-A107 153/9 1195

DORMAN, H. J.
Crustal Deformation and Seismic Measurements in the Region of Mcdonald Observatory, West Texas.
N82-11695/5 1169

DORTCH, MARK S.
Investigation of Release Temperatures for Kinzua Dam, Allegheny River, Pennsylvania. Hybrid Model Investigation.
AD-A106 974/9 1204

DORWARD, R. C.
Flaw Growth of 7075, 7475, 7050 and 7049 Aluminum Alloy Plate in Stress Corrosion Environments: 4-Year Marine Atmosphere Results.
N82-11181/6 1192

DOUGHERTY, E. E.
Formation Evaluation in Liquid-Dominated Geothermal Reservoirs.
DOE/ET/28384-T1 1162

DOUGLAS, DAVID E.
Industrial Program Grantee Conference. Proceedings of a Conference Held at Hot Springs, Arkansas, May 12-14, 1980,
PB82-132168 1092

DOUGLAS, W. E.
The Fracture of Thermosetting Resins after Exposure to Water.
AD-A107 237/0 1195

DRAKE, J. F.
The Lower-Hybrid-Drift Instability in Non-Antiparallel Reversed Field Plasmas.
AD-A107 269/3 1084

DRAZEN, ERICA
Methods for Evaluating Costs of Automated Hospital Information Systems.
PB82-134073 1096

DREHMEL, DENNIS C.
Tethered Balloon Sampling Systems for Monitoring Air Pollution.
PB82-126319 1210

DRESHFIELD, R. L.
Trends in High Temperature Gas Turbine Materials.
N82-11182/4 1193

DREVER, ROBERT G.
Experience with an Expendable Temperature and Velocity Profiler.
AD-A106 914/5 1156

DRINKWATER, FRED J. III
Report of the President's Task Force on Aircraft Crew Complement,
AD-A106 889/9 1106

DROSG, M.
Exp 3 H(p,N) exp 3 He Differential Cross Sections Below 5 MeV and the n- exp 3 He Cross Sections.
LA-8215-MS 1259

DRUMMOND, P. D.
Bifurcations and Multistability in Two-photon Processes.
PB82-133901 1152

DRUMMOND, T.
Time Dependence of Current at High Electric Fields in Al(x)Ga(1-x)As-GaAs Heterojunction Layers.
AD-A106 907/9 1262

DRYDEN, FORREST E.
Dioxins.
PB82-136847 1215

DUBART, J. CH.
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DUBEY, PRADEEP
Value Theory without Efficiency.
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DUDELZAK, B.
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LAL-78-32 1260

DUDZIAK, D. J.
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DUFFEY, T. A.
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DUKOWICZ, J. K.
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DUNAWAY, P. B.
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NVO-192(V.1) 1246

DUNAYEVSKY, V.
Fields near a Rapidly Propagating Crack-Tip in an Elastic Perfectly-Plastic Material.
AD-A107 350/1 1195

DUNCAN, DAVID
Computer Image Generation: Advanced Visual/Sensor Simulation.
AD-A107 098/6 1172

DUNDAS, J. B.
Myeloproliferative Disorder with Unusual Marrow Chromosome Constitution.
AD-A107 206/5 1123

DUNLAP, JOHN H.
Experience with an Expendable Temperature and Velocity Profiler.
AD-A106 914/5 1156

DUNN, G. H.
Electron-Ion Collisions.
PB82-133919 1152

DUPREE, A. K.
Theoretical Studies of Chromospheres and Winds in Cool Stars.
N82-12004/9 1082

DURKIN, JOHN
Evaluation of the Seismic System for Locating Trapped Miners.
PB82-138660 1167

DUTROW, RALPH W.
Financial Profile of 15 New Agricultural Marketing Cooperatives,
PB82-131202 1080

DWYER, DENNIS M.
In vivo and in vitro Localization of Leishmania within Macrophage Phagolysosomes: Use of Colloidal Gold as a Lysosomal Label.
AD-A106 956/6 1122

DYATLOV, V. D.
Photoemulsion Method Application for Investigation of Plasma Neutron Radiation.
NIIEFA-K-0357 1261

DYER, ROBERT S.
Dopamine Depletion Slows Retinal Transmission.
PB82-127432 1142

EAGER, M. H.
Infrared and Structural Analyses of Uranium Oxidation Products: Preliminary Results.
DE82000233 1151

EASON, J. W.
Model for the Elongation of Boron on Tungsten during Chemical Vapor Deposition.
AD-A106 989/7 1191

EAST, L. F.
The Design of a 'Jet Catcher'.
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EASTES, C.
Energy Use in Minnesota Public Buildings: Data Management and Analysis.
ORNL/CON-53 1182

EATON, B. E.
Prediction of the Critical Line of a Binary Mixture: Evaluation of the Interaction Parameters,
PB82-140583 1154

EATON, ROBERT A.
Pothole Primer. A Public Administrator's Guide to Understanding and Managing the Pothole Problem.
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EBERHARD, B. J.
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DE81030403 1243

EBERT, W. L.
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ECKERT, BETTY J.
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EDDEY, E. E.
SAR Processing on the MPP.
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EDMONDS, D. P.
Influence of Irradiation on the Tensile Properties of Austenitic Stainless Steel Weldments.
DE81032002 1221

EFF, KENNETH S.
Surface Drainage Design for Airfields and Heliports in Arctic and Subarctic Regions.
AD-A107 293/3 1205

EGGERS, DOUGLAS M.
Juvenile Salmonid and Baitfish Distribution, Abundance and Prey Resources in Selected Areas of Grays Harbor, Washington.
AD-A106 984/8 1155

EGGERS, S. J.
Efficient Access of Compressed Data.
LBL-10648 1095

EHRLICH, EUGENE
Survivability--The Effort and the Payoff.
AD-A107 108/3 1230

EICHELBERGER, JAMES W.
Performance Tests for the Evaluation of Computerized Gas Chromatography/Mass Spectrometry Equipment and Laboratories,
PB82-137662 1229

EICKNER, HERBERT W.
Fire Endurance Under Design Load for Walls of One-Story Three-Room Structures of Sandwich and Wood-Frame Construction,
PB82-144601 1227

EIDELMAN, S.
Model of Direct Initiation of Unconfined Detonations.
AD-A107 446/7 1251

EISENSTADT, M.
Possible Effects of Government and Industry Standards on Photovoltaic Products Liability.
DE81031936 1186

EISS, N. S. JR.
The Wear of Polymers Sliding on Polymeric Films Deposited on Rough Surfaces.
AD-A107 158/8 1195

ELDRIDGE, G. W.
Preparation of Large-Diameter GaAs Crystals.
AD-A107 395/6 1252

ELIZONDO, JORGE
Some Planning Theories (Algunos Enfoques de Planeacion),
PB82-135369 1092

ELKINS, ROBERT H.
Development and Field Verification of a Model of House Air Infiltration for Single Family Residences.
PB82-141110 1226

ELLINGSON, A. C.
Guidance for Implementing an Environmental, Safety and Health Assurance Program. Volume 12. Model Guidelines for Line Organization Environmental, Safety and Health Inspection and Monitoring Activities.
DE81030991 1138

Guidance for Implementing an Environmental, Safety and Health Assurance Program. Volume 13. Model Guidelines for Line Organization Environmental, Safety and Health Meetings.
DE81030980 1138

ELLIOTT, R. D.
Continuing Design Work for the Sierra Cooperative Pilot Project: Interim Report No. 4,
PB82-136607 1087

ELLIS, ARTHUR B.
Effects of Temperature on Excited-State Descriptions of Luminescent Photoelectrochemical Cells Employing Tellrium-Doped Cadmium Sulfide Electrodes.
AD-A107 544/9 1150

ELLIS, D. G.
Search for Promethium-Like Gold Lines and Other Transitions of Interest to Fusion Research.
DE81029917 1239

ELLIS, P. J.
Five Robust Indicators of Central Value,
PB82-133109 1198

ELLIS, ROBERT R.
Project Lame 80F: A Cultural Resource Survey Around Boulder Beach, Echo Bay, Temple Bar and Cottonwood Cove in the Lake Mead National Recreation Area Clark County, Nevada and Mohave County, Arizona,
PB82-109364 1104

ELLSWORTH, D. L.
Effects of a Thin SiO2 Layer on the Formation of Metal-Silicon Contacts.
AD-A107 121/6 1263

ELTGROTH, MARK W.
Scavenging of Aerosol Particles by Precipitation.
PB82-134404 1213

ENDER, RICHARD L.
Alaska OCS Socioeconomic Studies Program: St. George Basin Petroleum Development Scenarios, Anchorage Impact Analysis.
PB82-139825 1216

ENGI, DENNIS
Pathfinding Simulation (PATHS) User's Guide,
NUREG/CR-1589 1249

ENGLAND, T. R.
Delayed Neutron Calculations Using ENDF/B-V Data.
LA-UR-79-2890 1259

ENGRUM, HELEN L.
Department of Transportation Awards to Academic Institutions in Fiscal Year 1980,
PB82-141508 1216

ENTINGH, D. J.
An Approach to Identifying Objectives for Targeted Research Programs,
PB82-139585 1111

EPPERLY, W. R.
EDS Coal-Liquefaction Process Development. Phase V. EDS Commercial Plant Study Design Update: Illinois Coal. Volume 2. Base Case.
DOE/ET/10069-T1(V.2) 1146

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DOE/ET/10069-T1(V.3) 1146

ERICKSON, M. V.
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DOE/ET/27232-T4 1162

ERNEST, J.
Coal Desulfurization by Low Temperature Chlorinolysis, Phase 3.
N82-11145/1 1209

ERSHAGHI, I.
Formation Evaluation in Liquid-Dominated Geothermal Reservoirs.
DOE/ET/28384-T1 1162

ERZBERGER, H.
Algorithm for Fuel Conservative Horizontal Capture Trajectories.
N82-11018/0 1076

ESAKI, L.
Molecular Beam Epitaxy of Ge-GaAs Superlattices.
AD-A107 157/0 1252

Spatial Separation of Carriers in InAs-GaSb Superlattices.
AD-A107 155/4 1263

ESCOFFIER, FRANCIS F.
Linearized Solution to Inlet Equation with Inertia.
AD-A107 205/7 1156

Linearized Solution to Inlet Equation with Inertia. Stability of Rubble Mound Breakwaters. Particle Motion under Stokes Waves.
AD-A107 343/6 1156

ESFANDIARI, P.
New Generating Functions and Results for the Density Polynomials of the Lattice Gas.
PB82-137365 1263

ESPOSITO, JOHN L.
Saudi Arabia: The Flexibility of Islamic Fundamentalism,
AD-A106 930/1 1102

ESPOSITO, M. P.
Dioxins.
PB82-136847 1215

ESTEVA, LUIS
Probabilistic Analysis of Seismic Response of Multi-Supported Structures on Soft Soils (Analisis Probabilistico de la Respuesta Sismica de Estructuras Sobre Varios Apoyos en Suelos Blandos),
PB82-135377 1226

ESTEY, R. S.
Low-Cost Solar Array Project: Four Absolute Cavity Radiometer (Pyrheliometer) Intercomparisons at New River, Arizona: Radiometer Standards.
N82-11435/6 1228

ETCHEGOYEN, A.
A Study of the (26)Mg((12)C,(12)B)(26)Al Charge Exchange Reaction,
PB82-135740 1260

ETCHEGOYEN, M. C.
A Study of the (26)Mg((12)C,(12)B)(26)Al Charge Exchange Reaction,
PB82-135740 1260

ETEMAD, S.
Photoconductivity in Polyacetylene.
AD-A106 965/7 1194

Solitons in Polyacetylene: Effects of Dilute Doping on Optical Absorption Spectra.
AD-A106 964/0 1148

EUBANK, C. S.
Acceleration of Methane-Air Ignition by Hydrocarbon Additives.
AD-A107 009/3 1272

EVANS, ARTHUR JR.
The Impact of Multiprocessor Technology on High-Level Language Design.
AD-A107 533/2 1173

EVANS, DENIS J.
Behavior of a Nonconformal Mixture via Computer Simulation.
PB82-137423 1153

EVANS, MICHAEL P.
Oxygen Dynamics Study - Susquehanna River Below Conowingo Dam, Maryland: Volume I.
PB82-135971 1136

EWAN, V. J.
Reproducibility of Joint Spacing Measurements in Rock,
PB82-135344 1159

FABER, J. JR.
X-Ray Diffraction Study of Zr(Ca, Y)O sub 2-x; The Disordered State.
AD-A107 013/5 1252

FABER, V.
Block Relaxation Strategies.
LA-UR-80-2342 1197

FABRIKANT, J. I.
Spermatogonial Stem Cell Renewal Following Irradiation.
LBL-10109 1143

FAEHL, R. J.
Preliminary Simulation Studies of Accelerator Cavity Loading.
LA-8405-MS 1257

FAISS, R. O.
SAR Processing on the MPP.
N82-11801/9 1174

FAN, JOHN C.
GaAs Shallow-Homojunction Solar Cells on Ge-Coated Si Substrates.
AD-A107 056/4 1184

Sputtered Films for Wavelength-Selective Applications.
AD-A107 232/1 1200

Transient Annealing of Arsenic-Implanted Silicon Using a Graphite Strip Heater.
AD-A107 230/5 1222

FAN, M. W.
COMPUMAG: Papers Presented by Members of the Laboratory at the Conference of the Computation of Electromagnetic Field, Chicago, 14-17 September, 1981,
PB82-134164 1253

FANCHER, P. S.
Properties of Antilock Systems: Descriptive Parameters Used in Analyzing the Braking and Handling of Heavy Trucks. Volume 5.
PB82-133273 1221

FANTONE, STEPHEN D.
Engineering Aspects of Gradient-Index Optical Systems.
PB82-131996 1256

FARMER, B. M.
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MLM-2700 1246

FARMER, WILLIAM D.
An Approach for Assessing Missile System Dormant Reliability.
AD-A107 519/1 1232

FARRELL, G. E.
Proton Upsets in LSI Memories in Space.
AD-A107 331/1 1173

FARRELL, JAMES M.
An Examination of Year-End Spending with Regard to Department of Defense Contract Awards.
AD-A107 033/3 1089

FARRELL, R. A.
New Generating Functions and Results for the Density Polynomials of the Lattice Gas.
PB82-137365 1263

FARRELL, RAYMOND F.
Modification of a Commercial Atomic Absorption Spectrophotometer for Cold-Vapor Determination of Mercury.
PB82-135716 1229

FARRELL, W. E.
Seismological Discrimination and Yield Determination Research.
AD-A107 360/0 1168

FARWICK, D. G.
Thermophysical Properties of Selected Wear-Resistant Alloys.
HEDL-TME-79-6 1192

FATHIPOUR, M.
Effects of a Thin SiO2 Layer on the Formation of Metal-Silicon Contacts.
AD-A107 121/6 1263

FAULKENBERRY, B. H.
Seismic Related Errors at Diablo Canyon Nuclear Power Plant, Units 1 and 2. Docket Nos. 50-275 and 50-323, License Nos. CPPR-39 and CPPR-69, Pacific Gas and Electric Company.
NUREG-0862-ISSUE 1 1248

FAVA, NANCY E.
Profiles of Automotive Suppliers Industries-Engineered Mechanical Components and Systems: Volume I, Text.
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Profiles of Automotive Suppliers Industries-Engineered Mechanical Components and Systems: Volume II, Appendices.
PB82-129511 1098

FAVIN, S.
New Generating Functions and Results for the Density Polynomials of the Lattice Gas.
PB82-137365 1263

FAX, GENE E.
An Analysis of the Scope of Federal Laws and Regulations Controlling Exposures to Substances Which Cause Occupational Respiratory and Pulmonary Diseases.
PB82-134198 1103

FAY, D. A.
Neutron-Capture gamma-Ray Analysis of Coal for Sulfur, Iron, Silicon and Moisture.
IS-T-847 1165

FEIEREISEN, W. J.
Numerical Simulation of a Compressible Homogeneous, Turbulent Shear Flow.
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FELDMAN-SUMMERS, SHIRLEY
Rape Reporting: Causes and Consequences,
PB82-133380 1114

FELTZ, D. E.
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DE82000421 1247

FENG, DA FEI
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FENG, MEI
Initial Results of In Vitro Studies of Clavulanic Acid Synergism,
PB82-129735 1141

FERENBAUGH, R. W.
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LA-8217-PR 1136

FERNALD, F. G.
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DE81028744 1087

FERRALL, J.
Assessment of Advanced Coal Gasification Processes.
N82-11146/9 1147

FERRANTE, J.
Universal Binding Energy Relations in Metallic Adhesion.
N82-11183/2 1189

FERRARA, EARL R. JR.
Multichannel Adaptive Filtering for Signal Enhancement.
AD-A106 910/3 1233

The Time-Sequenced Adaptive Filter.
AD-A106 908/7 1178

FERREIRA, RODGER F.
Mean Annual Streamflow of Selected Drainage Basins in the Coal Area of Southeastern Montana.
PB82-137696 1160

FERRIS, M.
Urban Transportation Energy Accounts. Volume I - Procedures. Volume II - Case Study of the Chicago Region.
PB82-135542 1183

FERRY, D. K.
Charge Instabilities in Lateral Super-Lattices under Conditions of Population Inversion.
AD-A106 911/1 1262

Conceptual Problems in Modeling Submicron Device Physics.
AD-A107 159/6 1171

Hot-Carrier Microwave Conductivity in the Non-Zero Collision Duration Regime.
AD-A107 120/8 1263

FERZIGER, J. H.
Higher-Level Simulations of Turbulent Flows.
N82-11395/2 1254

Mixing of a Passive Scalar in Isotropic and Sheared Homogeneous Turbulence.
N82-11394/5 1254

Numerical Simulation of a Compressible Homogeneous, Turbulent Shear Flow.
N82-11396/0 1254

A Three-Dimensional Simulation of Transition and Early Turbulence in a Time-Developing Mixing Layer.
N82-11393/7 1254

FESER, JEANETTE F.
Antisecretory Effects of Berberine in Rat Ileum.
AD-A106 953/3 1141

FIELDS, D. E.
Determination of the Statistical Distributions of Model Parameters for Probabilistic Risk Assessment.
DE82000147 1197

FIELDS, S. R.
Dynamic Analysis to Establish Normal Shock and Vibration of Radioactive Material Shipping Packages.
NUREG/CR-2146-V1 1242

FIGGE, SANDRA S.
Audit of the Survey of Residential Buildings, Site I, Wave 3. Housing Assistance Supply Experiment,
PB82-144932 1119

FILLO, J. A.
Review of Melting and Evaporation of Fusion-Reactor First Walls.
DE81030035 1239

FILZ, R. C.
Proton Upsets in LSI Memories in Space.
AD-A107 331/1 1173

FINE, MORRIS E.
Thresholds for Fatigue Initiation and Propagation and Plastic Work in HY80 and HY130 Steels.
AD-A106 946/7 1191

FINK, G. C.
Steam Generator Chemical Cleaning: Demonstration Test No. 2 in a Pot Boiler.
DE81904251 1200

FINKLER, RONALD A.
The Critical Technologies Project Executive Summary.
AD-A107 489/7 1097

FINNIGAN, B. P.
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DE81030975 1185

FINSTEIN, M. S.
Sludge Composting and Utilization: Rational Approach to Process Control.
PB82-136243 1269

FIORETTI, THOMAS B.
In vivo and in vitro Localization of Leishmania within Macrophage Phagolysosomes: Use of Colloidal Gold as a Lysosomal Label.
AD-A106 956/6 1122

FIRESTONE, R. F.
Design, Engineering and Evaluation of Refractory Liners for Slagging Gasifiers. Sixth Quarterly Technical Progress Report, No. M6043-6(QTPR).
IITRI-M-6043-6(QTPR) 1268

FISCHMAN, HARVEY R.
Epidemiologic Study of Rocky Mountain Fever (RMSF).
PB82-115932 1131

FISCO, W. J.
Characterization of Pollutants at Holston Army Ammunition Plant,
AD-A107 340/2 1149

FISH, RICHARD H.
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FISHER, EUGENE A.
Brittle Materials Design, High Temperature Gas Turbine.
AD-A107 522/5 1189

FISHER, MERTON E.
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FISHER, RICHARD M.
TRACALS Evaluation Report. Airport Surveillance and Precision Approach Radar AN/GPN-24(V), Initial Evaluation Report, RAF Upper Heyford, England 11 Mar-25 April 81.
AD-A107 491/3 1237

FITZGERALD, R.
Design Methodology and Development History of an ISO OSI Layered Architecture for the Canadian Broadcast Telidon System.
N82-11337/4 1234

FITZPATRICK, JOANN
Case Studies of the Impact of Federal Aid on Major Cities: City of Cleveland.
PB82-131558 1114

FITZPATRICK, M. W.
Development of a Test Trailer for High-Volume Skid-Resistance Surveys.
PB82-135872 1214

FITZSIMMONS, T. C.
Ultra-Lightweight Mirror Manufacturing and Radiation Response Study.
AD-A106 998/8 1222

FLACHENECKER, GERHARD
Cross Correlation in a Space-Diversity System on a Military Vehicle.
AD-A107 114/1 1178

FLAHERTY, HUGH C.
National Dam Safety Program. Larchwood Lake Dam (Inventory Number NY 727), Susquehanna River Basin, Otsego County, New York. Phase I Inspection Report,
AD-A107 412/9 1207

National Dam Safety Program. Norwich Reservoir Number 2 Dam (Inventory Number NY 349), Susquehanna River Basin, Chenango County, New York. Phase I Inspection Report,
AD-A107 414/5 1207

National Dam Safety Program. Norwich Water Works Dam Number 1 (Inventory Number NY 347), Susquehanna River Basin, Chenango County, New York. Phase I Inspection Report,
AD-A107 411/1 1207

National Dam Safety Program. Robert L. Bishop Dam (Inventory Number N.Y. 534), Delaware River Basin, Delaware County, New York. Phase I Inspection Report,
AD-A107 413/7 1207

FLANDERS, STEPHEN N.
Cold Regions Testing of an Air-Transportable Shelter,
AD-A107 131/5 1226

FLEMING, ARTHUR W.
An Analysis of the Isoenzymes of Creatine Phosphokinase and Lactic Dehydrogenase in the Esophagus.
AD-A107 101/8 1120

FLOCK, W. L.
Telecommunications in Cometary Environments.
N82-11340/8 1234

FLORENCE, J. A.
Procedures for Petrophysical, Mineralogical and Geochemical Characterization of Fine-Grained Clastic Rocks and Sediments.
METC/CR-79/26 1158

FLOWERS, G. L.
Tool Force Evaluation of Lathe Machined High Explosives.
MHSMP-80-20 1250

FLOYD, TERRANCE L.
Inductively Coupled Plasma-Atomic Emission Spectrometric Analysis of Environmental Samples Using Ultrasonic Nebulization.
PB82-118209 1229

FLUECK, JOHN A.
Continuing Design Work for the Sierra Cooperative Pilot Project: Interim Report No. 4,
PB82-136607 1087

FLYNN, DANIEL R.
Effects of Time-Varying Noise on Annoyance: A Review,
PB82-133513 1112

FOARD, D. E.
Seed-Protein Genes and the Regulation of Their Expression. Progress Report.
DE81030165 1120

FOLEY, K. E.
Energy and Angle Resolve SIMS Studies of CO on Ni(001).
AD-A107 474/9 1149

FOLLIT, LAURIE B.
Comparison of the Caries-Preventive Effects of Neutral Sodium Fluoride and Acidulated Phosphate Fluoride.
PB82-135203 1132

PERSONAL AUTHOR INDEX

FONSECA, GEORGE F.
Effectiveness of Five Water-Cooled Undergarments in Reducing Heat Stress of Vehicle Crewmen Operating in a Hot Wet or Hot Dry Environment.
AD-A107 105/9 1143

FORDHAM, R.
The Certification of Polycyclic Aromatic Hydrocarbon Materials (PAH). Part II: The Six Methylchrysene Isomers (BRC Reference Materials No. 77, 78, 79, 80, 81 and 82).
PB82-138355 1153

FORREST, MICHAEL P.
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AD-A107 543/1 1208

FORSELL, DOUGLAS J.
Distribution and Abundance of Marine Birds and Mammals Wintering in the Kodiak Area of Alaska.
PB82-140187 1155

FOWLER, DOUGLAS P.
Industrial Hygiene Survey Report at Celotex Corporation, Pittston, Pennsylvania.
PB82-107103 1139

Industrial Hygiene Survey Report at U.S. Gypsum Corporation, Birmingham, Alabama.
PB82-107194 1139

FOWLER, MARTIN H.
Profiles of Basotho Farmers. Part I: Images of Basotho Farmers. Part II: Are the Basotho Subsistence Farmers. Part III: Progressive Farmers in Lesotho.
PB82-132762 1109

FOX, E.
Determination of Sample Container Effects on Wearmetals Concentration in MIL-L-7808 Synthetic Lubricant Analyzed on an A/E35U-3 Fluid Analysis Spectrometer.
AD-A107 323/8 1194

FOX, J. P.
Partitioning of Major, Minor, and Trace Elements During Simulated in-Situ Oil Shale Retorting.
LBL-9062 1151

Potential Uses of Spent Shale in the Treatment of Oil Shale Retort Waters.
LBL-11072 1209

FRAIM, F.
Research and Development: Systems for Transmitting Energy Through the Intact Skin.
PB82-129321 1142

FRAME, E. A.
Effects of Alcohol Fuels on Engine Wear.
AD-A107 136/4 1266

FRANCIS, RICHARD L.
A 'Uniformity Principle' for Evacuation Route Allocation.
PB82-140833 1199

FRANCOIS, J.
Effects of Aircraft Noise on the Equilibrium of Airport Residents: Testing and Utilization of a New Methodology.
N82-11636/9 1112

FRANK, CLYDE
Atmospheric Benzene Depletion by Soil Microorganisms.
PB82-126293 1170

FRANK, T. G.
Inertial Confinement Fusion Reactor Systems.
LA-UR-80-2499 1239

FRANKLIN, THOMAS M.
Coal Surface Mining Reclamation and Fish and Wildlife Relationships in the Eastern United States. Volume II: Opportunities and Approaches for Fish and Wildlife Planning and Management in Coal Surface Mining, Reclamation and Postmining Land Uses.
PB82-130824 1211

FRANKS, L. A.
Low-Level Transuranic Waste Assay by Photon Interrogation and Moderated Neutron Counting.
LA-7857 1244

FREDIANI, DAVID J.
Technology Assessment for Future EHF MILSATCOM Systems.
AD-A107 059/8 1233

FREEMAN, B. E.
Comparison of a Drainage Flow Model with the Data of Manins and Sawford.
DE81025066 1087

FREEMAN, LINTON C.
The Networkers Network: A Study of the Impact of a New Communications Medium on Sociometric Structure.
PB82-130386 1114

FREEMAN, RAY
Permit Fee Guideline.
PB82-107871 1210

FREEMAN, SUE C.
The Networkers Network: A Study of the Impact of a New Communications Medium on Sociometric Structure.
PB82-130386 1114

FREIWALD, D. A.
US Energy Sources and Materials Needs.
LASL-80-10(BRIEF) 1182

FRELIN, A. J.
Field Unit Readiness Study (FURS).
AD-A107 469/9 1109

FREUDENSTEIN, FERDINAND
An Integrated Approach to the Optimization of High-Speed Cam-Follower Systems.
AD-A107 387/3 1224

FRIAUF, WALTER S.
Four Input Coincidence Detector.
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FRIEDMAN, ALINDA
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FRISCH, A. S.
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FRUIN, JOHN T.
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Primary Dermal Irritation Potential of Components of the M-258A-1 Decontamination Kit (Study 4).
AD-A107 382/4 1144

Primary Dermal Irritation Potential of the Insect Repellent CHF1 and Its Components.
AD-A106 944/2 1144

FRYER, GERARD J.
Compressional-Shear Wave Coupling Induced by Velocity Gradients in Marine Sediments.
AD-A107 026/7 1252

FU, K. S.
Inference Procedure with Uncertainty for Problem Reduction Method.
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FU, KING SUN
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FUCHS, W.
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FULLER, A. T.
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FULLER, E. L. JR.
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FURUKAWA, K.
Crustal Structure of the Shatsky Rise from Seismic Refraction Measurements.
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FYTAS, G.
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AD-A107 161/2 1195

Photon Correlation Spectroscopy of Bulk Siloxane Polymers.
AD-A107 153/9 1195

GABEL, JON R.
Physicians and Financial Incentives.
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GABRIEL, T. A.
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GABRIELSEN, R. E.
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GAFFIN, W. O.
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GAGGERO, E. D.
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GAILLOCHET, M.
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GAJDUSEK, D. CARLETON
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GALBRAITH, J. H.
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GJBX-136(80) 1162

GALE, RONALD P.
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GALES, C.
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GALLAGHER, D. L.
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AD-A107 217/2 1082

GAN, ELSIE
Rickettsia tsutsugamushi Antibody in Mother/Cord Pairs of Sera.
AD-A106 957/4 1122

Scrub Typhus Antibody in Cynomolgus Monkeys (Macaca fascicularis) in Malaysia.
AD-A106 955/8 1122

GAN, OWEN
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AD-A107 346/9 1144

GANLEY, OSWALD H.
The Role of Communications and Information Resources in Canada.
PB82-129057 1235

GARCIA, DANIEL H.
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AD-A107 034/1 1085

GARCIA, R. D.
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GARDINER, W. C. JR.
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GARDNER, CARLEEN
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GARLOUGH, R. H.
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GARRISON, B. J.
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GARRUTO, RALPH M.
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GARSON, SEYMOUR
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GASTON, R. J.
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ORAU-168 1166

GATHMAN, S. G.
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GATLAND, I. R.
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GATTI, R. C.
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GAYLORD, R. E.
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GE, QINSHENG
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GEE, SONIA A.
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GEIGER, G. LESLIE
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GEIS, MICHAEL W.
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GEISELMAN, RALPH E.
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GELDREICH, EDWIN E.
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GHANDHI, S. K.
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GHASSEMI, MASOOD
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GHOSH, A. K.
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GIBBS, P. M.
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GIBSON, W. M.
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GILBERT, J. A.
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GILBERT, TERRY
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GILL, T.
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GILMER, R. W.
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GILMORE, P. A.
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GLADD, N. T.
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GLANDON, S. R.
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GLASCOCK, M.
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GLASS, DALE
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GLASS, DAVID V.
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AD-A107 141/4 1230

GLASS, G. E.
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PB82-128117 1136

GLASS, N. R.
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GLEASON, G.
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GLENN, W. H.
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GLICK, NORMAN S.
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GLOCK, MARVIN D.
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GOAD, W. K.
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GODBEY, ROBERT CARSON
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GODDEN, W. G.
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GOETTLE, R. J. IV
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GOFFIN, JEAN-LOUIS
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GOIN, K. L.
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GOODWIN, WILLIAM V.
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GRAEBER, GEOFFREY M.
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GRAF, E. R.
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GRAVES, J. R.
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GRAVES, R. L.
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GREENFIELD, ROY J.
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GREENSPAN, NANCY
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GREENSPAN, NANCY T.
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GREENWALD, A. C.
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GREENWOOD, PETER H.
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GREGORKA, LISA
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GRUBIN, H. L.
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GU, CHUNXIA
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GUDIKSEN, P. H.
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GUPTA, J.
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GURNETT, D. A.
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Parametric Interaction and Spatial Collapse of Beam-Driven Langmuir Waves in the Solar Wind.
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GUYMON, E. PARK
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HA, H. B.
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Decapsulation of Brine Shrimp ('Artemia salina') Cysts,
PB82-136631 1121

Intensive Culture of Walleye ('Stizostedion vitreum vitreum'),
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HAIRE, R. G.
Magnetic Susceptibility of Curium Pnictides.
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HAKKILA, E. A.
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HALE, LESLIE C.
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HALE, R. R.
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HALL, R. A.
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HAMMER, CHARLES F.
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HAMMOND, KENNETH R.
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HAMSTRA, J.
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HANCOCK, L. S.
Manufacturing Methods and Technology Project Execution Report.
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HANDY, L. L.
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DOE/ET/28384-T1 1162

HANES, MARTHA A.
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Primary Dermal Irritation Potential of Components of the M-258A-1 Decontamination Kit (Study 4).
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Primary Dermal Irritation Potential of the Insect Repellent CHF1 and Its Components.
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HANEY, H. P.
A Comparison of Theoretical and Experimental Pressure Distributions for Two Advanced Fighter Wings.
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HANLEY, H. J. M.
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Prediction of the Critical Line of a Binary Mixture: Evaluation of the Interaction Parameters,
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HANLEY, J. T.
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HANNAFORD, JACK A.
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HANNON, KEVIN
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HANRAHAN, MICHAEL S.
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HANSEN, D. J.
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HANSEN, JAMES GERALD RAYMOND
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HARADA, Y.
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HARDCASTLE, S. E.
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HARDY, K. R.
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HARDY, KENNETH R.
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HARMAN, THEODORE C.
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HARMON, JOHN W.
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Verdict on Vagotomy.
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HARNED, DOUGLAS S.
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HARRINGTON, B. W. JR.
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HARRINGTON, R. M.
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HARRINGTON, ROGER F.
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HARRIS, A. S.
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HASS, B. S.
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HASSE, K. R.
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HAUGHT, KENNETH M.
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HAWS, L. D.
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HE, LIANYIN
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HEALEY, SARA A.
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HEAPS, MELVIN G.
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HEATH, GREGORY E.
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HECHT, HERBERT
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HEDEMAN, E. RUTH
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HEEGER, A. J.
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HEGG, DEAN A.
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HELLIAR-SYMONS, R. D.
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HELMBERGER, D. V.
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HELYER, M. H.
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Symmetry Extinction of LEED Beams for Naphthalene Adsorbed on Pt(lll).
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HENDERSON, VERNON
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HENDREN, R. WAYNE
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AD-A106 820/4 1105

Effect of Work Schedule, and Description of Career Intention on Organizational Effectiveness.
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HENRION, M.
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HENRY, RONALD A.
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HERRICK, J. W.
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HERTEL, GERARD D.
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HERZOG, WILLIAM N.
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AD-A107 447/5 1221

HESS, K.
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HICKEY, JAMES T.
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HICKMAN, ROBERT A.
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Military Retention and Retirement. Reciprocal Family/Organization Effects,
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HICKS, R. M.
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N82-11054/5 1078

HIEFTJE, GARY M.
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HIGBEE, C.
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HIMMEL, R. L.
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HIRSCH, KATHERINE V.
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HIRSCH, STANLEY N.
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HIRSCHBUEHLER, K. R.
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HIRST, E.
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HITCH, L. S.
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HITNEY, L. R.
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HITTLE, JEAN E.
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HO, D.
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HOBBY, G. L.
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HOBSON, RICHARD D.
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HOCHBERG, PHILIP R.
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LEWIS, B. L.
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LINNERUD, H. J.
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LIPSCOMB, GREG
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PB82-129073 1235

LISANSKY, JUDITH
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LISANTI, B.
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LISOWSKI, P. W.
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LISTOKIN, DAVID
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LITTLE, LINDA W.
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LIU, BENJAMIN Y. H.
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LIU, C. T.
Metallurgical and Mechanical Properties of Thorium-Doped Ir-0.3% W Alloys.
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LIU, HSI HO
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LIU, J. T. C.
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LIU, S.
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LIVERMAN, DORA
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LIVINGSTON, J. M.
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LLEWELLYN, CRAIG H.
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LO SURDO, ANTONIO
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AD-A107 223/0 1149

Apparent Molal Volumes and Adiabatic Compressibilities of Aqueous Transition Metal Chlorides at 25 c.
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LOEVINGER, ROBERT
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LOFTUS, JAMES J.
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LOGAN, K. E.
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LOKMANHEKIM, M.
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LOLLAR, L. F.
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LOMBARDO, LAWRENCE M.
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LONG, KATHERINE S.
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LONG, W. H. JR.
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LOO, B. W.
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LORENSON, KAREN R.
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LOVE, O. THOMAS JR.
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LOVELESS, JOHN H.
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LOVELUCK, J. M.
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LOVESEY, S. W.
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LUGT, A. VANDER
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LUHKS, RONALD A.
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LUNARDINI, VIRGIL
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LUNDBERG, D. R.
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LUO, HUIRONG
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LUQUOHG, JIAO
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LUSIGNEA, RICHARD W.
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LYALL, JOHN P.
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LYLES, RICHARD W.
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LYONS, D. J.
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LYSMER, JOHN
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LYUKOV, V. V.
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MA, LINGJIA
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MACADAM, C. C.
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MACCREHAN, WILLIAM A.
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MACDIARMID, A. G.
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MACDONALD, D. D.
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MACGREGOR, S. T.
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MACK, E. J.
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MACKAY, JAMISON
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MACKIE, ALICK J.
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MACLANAHAN, D. A. JR.
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MACLENNAN, BRUCE J.
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MACPHAIL, ROBERT C.
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MACRAE, C. DUNCAN
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MACRISS, ROBERT A.
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MADEY, THEODORE E.
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MAGEE, C. W.
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MAGEE, P. M.
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MAGEE, R. A.
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MAGER, M.
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MAGERL, A.
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MAGNUSON, ROBERT A.
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MAHER, J. T.
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MAHER, JOHN R.
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MAINS, R. K.
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MAJID, H. A.
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MALLINGER, ARNOLD
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MALMUTH, N. D.
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MANCINI, ARMANDO
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MANGELSDORFF, A. DAVID
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Flexitime in an Army Medical Center.
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Teleradiology.
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MANGHNANI, MURLI H.
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MANGOLDS, A.
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MANHEIMER, W. M.
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MANKBADI, R.
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MANNA, ZOHAR
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MANNER, A. R.
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MANOLA, FRANK
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PB82-136763 1176

MANOOCH, CHARLES S. III.
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MANSER, G. E.
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MANUWAL, DAVID A.
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MARBACH, H. W. JR.
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MARCANIK, J.
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MARCHANT, G. H. JR
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MARG, N. M.
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MARGREY, STUART L.
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MARGULIS, STEPHEN T.
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MARINO, K. L.
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MARKING, LEIF L.
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MARNANE, WILLIAM G.
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MARSH, JAMES E.
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MARSH, S. F.
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MARSHALL, ALBERT
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MARSHALL, J.
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MARSHALL, SUE A.
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MARTIN, M. V.
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MARTIN, RAY E.
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MARTIN, SEELYE
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MARTINEK, HAROLD
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MARTINEZ, R.
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MASON, CARL J.
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MASON, JAMES B.
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MAST, P. K.
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MATHEWS, L. A.
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MATSUNO, K.
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MATSUSUE, K.
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MATSUZAKI, Y.
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MATTHEI, K. W.
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MATTOX, R. M.
Space Shuttle Main Engine Controller.
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MATVEEV, V. A.
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MAURIZI, ALEX R.
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MAUTZ, JOSEPH R.
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MAVRODINEANU, R.
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MAWDSLEY, ROBERTA H.
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AD-A107 324/6 1142

MAY, G. A.
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MAY, W. E.
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MAYER, JOSEPH W.
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PB82-135211 1099

MAYHAN, JOSEPH T.
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AD-A107 058/0 1178

MAYNARD, D. P.
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MAYNE, D. Q.
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AD-A107 275/0 1197

MAZIASZ, P. J.
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MAZOR, S. D.
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MCARTHUR, DAVID
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AD-A107 139/8 1236

MCAVOY, B. R.
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MCCALL, NELDA
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MCCARROLL, JAMES E.
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MCCARTHY, J.
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MCCLELLAN, J. H.
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AD-A107 124/0 1177

MCCLELLAND, GARY H.
Integration of Theory and Research in Judgment and Decision Making.
AD-A107 385/7 1112

MCCLUNG, R. M.
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MCCLURE, JOE P.
Biomass in Southeastern Forests.
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MCCOMB, H. G. JR.
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MCCORMACK, JEANNE
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MCCRARY, D. G.
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The Environmental Vegetation Index: A Tool Potentially Useful for Arid Land Management.
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MCCULLOH, K. E.
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MCCULLOUGH, JAMES D.
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MCDANIEL, E. W.
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MCDANIEL, WILLIAM C.
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MCDONALD, C.
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MCDONALD, C. F.
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MCDOUGAL, A. R.
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MCELWAIN, IVAN B.
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MCFARLANE, JAMES C.
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MCGARRITY, JAMES M.
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MCGHEE, R. J.
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MCGUIRE, S. C.
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DE81025833 1243

MCGUIRE, W. G.
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MCHENRY, WILLIAM K.
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MCIVER, R. D.
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MCKINLEY, ROBERT L.
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MCKUBRE, M. C. H.
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MCLAREN, D.
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MCLAWHORN, DAVID W.
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NOLT, I. G.
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NOWELL, LARRY H.
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NUHFER, E. B.
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NWALOR, J.
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NYGAARD, DAVID FERGUS
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O'BRIEN, EUGENE
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O'KEEFE, A.
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O'MALLEY, T. J.
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O'NEILL, KEVIN
Bottom Heat Transfer to Water Bodies in Winter. AD-A106 977/2 1159

O'NEILL, M. W.
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Field Study of Pile Group Action. Appendix B. PB82-137647 1215

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OBERMILLER, S.
PLUMBBOB Series, 1957. AD-A107 317/0 1241

ODERWALD, R. G.
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ODOR, DAVID D.
Determination of Contract Suitability to the Award Fee Concept. AD-A107 465/7 1090

OETTINGER, ANTHONY G.
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The Traditional State Side of Telecommunications Cost Allocations, PB82-129107 1235

OGIEVETSKY, V. I.
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OHANIAN, M. J.
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OHKAWA, T.
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OHNUMA, T.
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OHYAMA, T.
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OKAMOTO, M.
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OKHLOPKOVA, V. A.
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OLANDER, D. R.
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OLDER, MARK ELWOOD III
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OLDHAM, TIMOTHY R.
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OLENDER, H.
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OLENICK, JOHN G.
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OLIVARES, ALFREDO
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OLSEN, L. C.
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OMURA, J. K.
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ONO, K.
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OOSTERHOF, D. K.
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OPPENHEIM, ALAN V.
Digital Signal Processing Research. AD-A107 124/0 1177

OPRESKO, D. M.
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ORAN, W. A.
Gas Levitator and Method for Containerless Processing. PAT-APPL-6-297 486 1224

ORANGE, L.
Voltage Gradients in Solar Array Cavities as Possible Breakdown Sites in Spacecraft-Charging-Induced Discharges. N82-11107/1 1186

ORECHWA, Y.
Optimization of Radially Heterogenous 1000-MW(E) LMFBR Core Configurations. Appendix C. Research Project 620-25. EPRI-NP-1000(V.3) 1247

ORRELL, HERMAN M. III.
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OSHIDA, P. S.
Marine and Estuarine Pollution. PB82-128174 1136

OSLEEB, JEFFREY P.
Implications of Power Plant Coal Conversions on the Ports of New England: Volume I. PB82-136409 1231

Implications of Power Plant Coal Conversions on the Ports of New England. Volume II: Appendices, PB82-136417 1231

OSTERHOLZ, J. L.
Application of Digital Troposcatter to the DCS. AD-A107 303/0 1234

OSTERMAN, PAUL
The Impact of Regulation upon Job Design: A Preliminary Study. PB82-133760 1110

OTAZO, JAOQUIN J.
Digital Filters for Infrared Target Acquisition Sensors. AD-A107 061/4 1236

OTIS, G.
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OTTINGER, P. F.
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OVALLE, NESTOR K.
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Effect of Work Schedule, and Description of Career Intention on Organizational Effectiveness. AD-A106 819/6 1105

OVERBO, LOREN
CLMTIC3 - Tally Incidence of Characters. PB82-121856 1175

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OWEN, L. B.
Signal Analysis Van Hardware Operation General Description. Volume 1. AD-A106 948/3 1238

OWENS, E. C.
Effects of Alcohol Fuels on Engine Wear. AD-A107 136/4 1266

OWENS, J. W.
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OZAKI, M.
Photoconductivity in Polyacetylene. AD-A106 965/7 1194

Solitons in Polyacetylene: Effects of Dilute Doping on Optical Absorption Spectra. AD-A106 964/0 1148

OZANNE, LARRY
Fair Market Rents (FMRs) for Existing Dwellings: An Evaluation Through Hedonic Index Methods, PB82-144466 1116

OZEROFF, W. J.
PLUMBBOB Series, 1957. AD-A107 317/0 1241

PACE, CARL E.
Structural Stability Evaluation, Winnibigoshish Dam. AD-A107 337/8 1205

PACK, D. J.
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PAGE, T. F.
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PAI, R. Y.
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PAIGE, D. M.
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PALAZZO, ANTONIO J.
Wastewater Treatment by a Prototype Slow Rate Land Treatment System,

AD-A106 975/6 1080

PALLAVICINI, R.
Relations among Stellar X-ray Emission Observed from Einstein, Stellar Rotation and Bolometric Luminosity.
PB82-133869 1083

PANDOLF, K. B.
Prediction of Energy Expenditure during Load Carriage at High Altitude.
AD-A106 852/7 1143

PANDOLF, KENT B.
Heat Balance and Transfer in Men and Women Exercising in Hot-Dry and Hot-Wet Conditions.
AD-A107 004/4 1144

PAPPERT, R. A.
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PARDUE, H. L.
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PARENTI, RONALD R.
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PARIS, R. B.
Resistive G-Modes and Ballooning.
LA-UR-80-738 1261

PARISI, ALFRED F.
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PB82-137951 1134

PARISI, J.
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LPC-79-03 1260

PARKER, STANLEY
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PARKER, WARREN A.
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Evaluation of the Effectiveness and Efficiency of Preventive Dentistry Programs: Assessment of the Relationship between Past Dental Experience and Dental Sick Call in the Field.
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Teleradiology.
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PARKHURST, WENDY
Battery Separators Based on Polyphenylquinoxaline Polymer Blends.
AD-A107 130/7 1195

Pore Size, Zinc Penetration, and Zinc Diffusion Studies on PPQ/CA Separators.
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PARRIS, R. M.
Determination of Polychlorinated Biphenyls in Waste and Lubricating Oils.
PB82-133950 1153

PARRISH, ROBERT N.
Development of Data Processing Strategies for Potential Application in the Tactical Operations Systems (TOS) and Other Tactical Data Systems.
AD-A107 532/4 1232

PASCAL, ANTHONY H.
Relevance to HUD of Recent Scholarly Research in Urban Economics,
PB82-144452 1101

PATER, L. L.
Use of Foam to Reduce Gun Blast Noise Levels.
AD-A107 081/2 1251

PATER, R. H.
Novel Improved PMR Polyimides.
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PATRICK, S.
Terrestrial Solar Simulators for Photovoltaic and Combined Photovoltaic and Thermal Device Measurement and Evaluation.
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PATTERSON, E. W.
Improved Simulation of Aerosol, Cloud, and Density Measurements by Shuttle Lidar.
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PAUL, D. R.
Miscible Polymer Blends Based on Polycarbonate and a Copolyester.
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PAUL, DOUGLAS B.
The Spectral Envelope Estimation Vocoder.
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PAWLAK, T.
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PAXTON, H. C.
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PEABODY, ROBERT
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PEALE, S. J.
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PEARCE, E.
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PEARSON, ALEXANDER R.
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PEARSON, C. F.
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PEAVY, BRADLEY A.
Documentation of Program for Determination of Conduction Transfer Functions,
PB82-136284 1226

Single-Room Heat Balance for Building Heat Transfer,
PB82-135609 1226

PEAVY, SALLY T.
Test Problems and Results for OMNITAB 80.
PB82-136474 1176

PEDERSEN, JEANNE C.
Theoretical Investigation of Absorptive Processes.
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PEDERSEN, NORMAN E.
Theoretical Investigation of Absorptive Processes.
AD-A107 278/4 1253

PEDERSON, DONALD O.
Design Aids for VLSI: The Berkeley Perspective.
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PEELLE, E.
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PENDERGRASS, J. H.
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PENNEMAN, R. A.
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PENNY, MIKE F.
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PERREIRA, J.
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Automated Water Monitor System Field Demonstration Test Report. Volume 2: Technical Summary.
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PERROUD, P.
The Storage of Hydrogen in the Form of Metal Hydrides: An Application to Thermal Engines.
N82-11225/1 1269

PERRY, BRYCE E.
Two-Photon Laser-Induced Fluorescence in Oxygen and Nitrogen Atoms.
AD-A107 017/6 1148

PERRY, JOSPEH A.
Modification of a Commercial Atomic Absorption Spectrophotometer for Cold-Vapor Determination of Mercury.
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PERYT, W
Proton Spectra in High-Energy Pion-Nuclei Collisions Not Accompanied by Multiparticle Production.
JINR-E-1-11975 1258

PESCH, GERALD G.
Baseline Study of Effects of Ionizing Radiation on the Chromosomes of the Marine Worm, 'Neanthes arenaceodentata'.
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PETERS, CURTIS C.
Fire Endurance Under Design Load for Walls of One-Story Three-Room Structures of Sandwich and Wood-Frame Construction,
PB82-144601 1227

PETERSEN, STEPHEN R.
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PETERSON, C. L.
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PETERSON, J. R.
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DE82000148 1263

PETERSON, MARGARET
Trends in Recreational Use of National Forest Wilderness.
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PETERSON, V. Z.
Study of Neutrino-Produced Dimuons Using the Fermilab 15-Foot Bubble Chamber and External Muon Identifier.
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PETKUS, EDWARD P.
How to Make TIGER Perform: A Supplementary Operator's Manual for the TIGER Code.
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PETRICK, S. W.
Radiative Cooler.
PAT-APPL-6-284 289 1201

PETRIMOULX, HAROLD J.
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PETTIGREW, KENNETH W.
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AD-A107 342/8 1108

PFLUG, DONALD R.
Space-Based Radar Array System Simulation and Validation.
AD-A106 996/2 1238

PHAIR, PAMELA W.
The Health Opinion Survey: Predicting Illness in Military Trainees.
AD-A106 853/5 1122

PHELPS, A. V.
Excitation of the O(2)(a sup 1 delta(g)) State by Low Energy Electrons.
PB82-133851 1152

PHILBRICK, C. R.
Empirical F-Region Model Development Based on S3-1 Satellite Measurements,
AD-A107 403/8 1084

Measurements of Structural Features in Profiles of Mesospheric Density.
AD-A107 330/3 1084

PHILIPP, KURT R.
Oxygen Dynamics Study - Susquehanna River Below Conowingo Dam, Maryland: Volume I.
PB82-135971 1136

PHILIS, C.
Evaluation of the Capture Cross Section of exp 169 Tm from 10 exp -5 EV to 2.10 exp 7 EV.
CEA-CONF-4469 1257

PHILLIPS, CHARLES L.
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PHILLIPS, DAVID M.
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PHILLIPS, JOHN C.
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AD-A107 172/9 1104

PHILLIPS, M. W.
Durability of Simulated Supercalcine Ceramics at Geologic Storage Conditions.
NUREG/CR-2418 1245

PHILLIPS, MICHAEL B.
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PB82-134198 1103

PHINNEY, D. E.
Evaluation of Gravimetric Ground Truth Soil Moisture Data Collected for the Agricultural Soil Moisture Experiment, 1978 Colby, Kansas, Aircraft Mission.
N81-29494/4 1169

PHINNEY, W. C.
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N82-11691/4 1158

PICKERING, Q. H.
Effects of Pollution on Freshwater Fish.
PB82-127358 1136

PICKETT, KAREN L.
Finance Issues: County Highways and Public Transit,
PB82-128828 1091

PICKETT, M. W.
Trial of a Computer Generated Travel Information System in Two British Rail Travel Enquiry Bureaux,
PB82-135781 1096

PIERSKALLA, WILLIAM P.
Optimal Control of a Network of Whole Blood Banks: Target Inventory Levels for a Hospital Blood Bank or a Decentralized Regional Blood Banking System.
PB82-106816 1130

PIGG, J. L.
Low-Level Transuranic Waste Assay by Photon Interrogation and Moderated Neutron Counting.
LA-7857 1244

PILIE, R. J.
Aerosol Composition in the Marine and Coastal Boundary Layer.
AD-A107 308/9 1084

PIMENTAL, NANCY A.
Heat Balance and Transfer in Men and Women Exercising in Hot-Dry and Hot-Wet Conditions.
AD-A107 004/4 1144

PINES, S.
An Influence Coefficient Method for the Application of the Modal Technique to Wing Flutter Suppression of the Dast Arw-1 Wing.
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PIPES, R. B.
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AD-A107 391/5 1190

PIPKIN, FRANCIS M.
Atomic Physics 7.
AD-A107 089/5 1148

PITCHER, P. D.
Applications of the Microscan 9 Microanalyser.
AD-A106 969/9 1148

PITTMAN, C. U. JR.
Synthesis, Radiation Degradation, and Electron Beam Resist Behavior of Fluorine-Containing Vinyl Polymers.
AD-A106 913/7 1194

PIZAM, ABRAHAM
Vacation Farm Cooperatives,
PB82-134388 1080

PLATT, ALVIN W.
Joining the Defense Directives and Defense Acquisition Regulatory Systems,
AD-A107 142/2 1230

PLEASURE, J. W.
Signal Analysis Van Hardware Operation General Description. Volume 1.
AD-A106 948/3 1238

PLECENIK, R. M.
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AD-A107 154/7 1148

PLITMAN, MICHAEL L.
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PLONKO, MURIEL C.
Liquid-Phase Epitaxial Growth of InP and InGaAsP Alloys.
AD-A107 233/9 1252

PLUMB, TIMOTHY R.
Oak Management in California.
PB82-134453 1082

PLUTA, J.
Proton Spectra in High-Energy Pion-Nuclei Collisions Not Accompanied by Multiparticle Production.
JINR-E-1-11975 1258

PO-CHEDLEY, D. A.
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PODGORETSKIJ, M. I.
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POEL, J. D.
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N82-11991/8 1209

Automated Water Monitor System Field Demonstration Test Report. Volume 2: Technical Summary.
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POISSON, ALAIN
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POLAK, E.
An Exact Penalty Function Algorithm for Optimal Control Problems with Control and Terminal Equality Constraints. Part 1.
AD-A107 275/0 1197

POLSON, MARTHA CAMPBELL
Cerebral Economics: Resource Competition within but not Between Hemispheres.
AD-A107 362/6 1112

POLVANI, R. S.
Microcreep of Instrument Grade Beryllium.
PB82-137415 1193

POMORSKI, K.
Shape of Fast Rotating Heated Nuclei. Calculation Results.
JINR-R-4-12399 1259

POOCK, GARY K.
Effect of Operator Mental Loading on Voice Recognition System Performance.
AD-A107 477/2 1234

Effect of Task Duration on Voice Recognition System Performance.
AD-A107 442/6 1104

Enhancing Technology Transfer of Computer Hardware and Software Architectures Using Human Factors in Initial Design.
AD-A107 444/2 1104

POOLE, MARJORIE C.
Evaluation of the Program of Nursing Services,
PB82-136920 1134

POON, P. T.
Secondary and Compound Concentrators for Parabolic Dish Solar Thermal Power Systems.
N82-11550/2 1182

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SMITH, J. R.
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SMITH, JOHN
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SMITH, M. W.
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SMITH, P. M.
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SMITH, R. T.
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SMITH, RICHARD H.
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SMOKER, ROY E.
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SMOOT, JAMES L.
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SMYRL, N. R.
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SMYTH, K. A.
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SNIDER, M. A.
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SNOW, W. L.
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SOBCZAK, CONRAD L.
Evaluation of a New Community Rape Treatment Center,
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SOHN, H. Y.
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SOHOLT, LARS F.
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SOKATCHEV, E. S.
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SOLLID, J. E.
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SOLNYSHKOV, A. I.
Distributive Cathodes in Duoplasmatron Ion Sources.
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SOLNYSHKOVA, Z. G.
Distributive Cathodes in Duoplasmatron Ion Sources.
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SOLOMON, NEIL G.
High Temperature Metallic Recuperator.
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SOLTIS, LAWRENCE A.
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SOMMER, W. F.
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SONDEREGGER, R. C.
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SONI, M. L.
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SORIN, A. S.
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SOROKIN, P. P.
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SOURKES, A. M.
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SPANIER, GERARD
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SPARKS, L. E.
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SPARKS, L. L.
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SPARKS, LESLIE E.
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SPEHAR, R. L.
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SPEICH, STEVEN M.
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SPENCER, R. L.
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SPENDLEY, PAUL K.
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SPITS, BRUCE
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SPITZ, BRUCE
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SPIZZICHINO, F.
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SPRADLIN, H. K. L.
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STABEKIS, P. D.
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STACK, R. E.
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Commercial Cooking Equipment Improvement. Volume I: Range Ovens.
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STAFF, DENNIS J.
Architectural and Historical Survey on Approximately 121,265 Acres in Central North Dakota.
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STAIFF, D. C.
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STALLINGS, D. W.
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STALNAKER, D. K.
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STANCATO, F. A.
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STANCAVAGE, FRANCES B.
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STASKUS, J. V.
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STASNY, G. S.
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STEARNS, PALMER
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STEARNS, S. RUSSELL
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STECKI, J.
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STEEB, H.
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STEGER, J. L.
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STEINBERG, M. P.
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STEINBUGLER, M.
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STEINHARDT, BRUCE
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STEINVALL, O.
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STENCEL, R. E.
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STEPHANEDES, YORGOS J.
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STERN, R. A.
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STEVENS, ALAN A.
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STEVENS, GORDON W.
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STEVENS, HOWARD O.
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STEVENS, MARK L.
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STEVENS, N. J.
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STEVENSON, M. G.
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STEVENSON, R. H.
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STEWART, D. A.
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STEWART, G. S.
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STIASSNIE, MICHAEL
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STILES, H.
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STILLE, J. K.
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STOFFER, G. R.
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STOKER, A. K.
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STOLL, E.
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STONE, J. A.
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STONE, ROBERT
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STONEHART, P.
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STONER, E. R.
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STONESTROM, P.
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STORIE, M.
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STRADA, JOSEPH A.
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STRANGWAY, D.
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STREET, G. B.
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Preparation and Characterization of Neutral and Oxidized Polypyrrole Films.
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STREETMAN, B. G.
Theoretical and Experimental Investigation of the Dynamics of Pulsed Laser Annealing of Amorphous Silicon.
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Time Dependence of Current at High Electric Fields in Al(x)Ga(1-x)As-GaAs Heterojunction Layers.
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STREL'TSOV, V. N.
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STRICKLER, M. PATRICIA
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STRONG, D. T. G.
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STROUP, C.
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STRUGALSKI, Z.
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Proton Multiplicity Distributions in High-Energy Hadron-Nuclei Collisions.
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Proton Spectra in High-Energy Pion-Nuclei Collisions Not Accompanied by Multiparticle Production.
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STUART, J. T.
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STUDER, DAVID
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SU, S. F.
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SUDBURY, ROGER W.
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SUGAR, J.
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SULLIVAN, J. D.
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SULLIVAN, S.
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SUNDELIN, R. N.
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SURLES, T. G.
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SURSEN, G.
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SUTHERLAND, S. H.
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SUTTON, GEORGE H.
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SUZUKI, N.
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SWABB, EDWARD A.
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SWAIN, J. C.
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SWANGER, H. J.
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SWANKIN, DAVID A.
Rationale Statements for Voluntary Standards - Issues, Techniques, and Consequences.
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SWANSON, C.
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SWENSON, MICHELLE
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Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume IV: Beneficiary Survey.
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SWIFT, EVERETT R.
NAVPAC SST Data Processing--Mathematical Description.
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SYKES, R. I.
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SYMONS, JAMES M.
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SZALWINSKI, C. M.
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SZARA, STEPHEN I.
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SZYCHER, M.
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TABAS, PHILIP
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TACHIBANA, K.
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TAFT, J. P.
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TAHIR-KHELI, SHIRIN
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TAI, YUAN-HENG
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Reversal of Cholera Toxin-Induced Secretion in Rat Ileum by Luminal Berberine.
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TAIWO, O.
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PB82-134792 1147

TAKAHARA, K.
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TAKESHIGE, I.
Magnesium Hydroxide Neutron-Shielding Material and Method of Producing Such Material.
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TALIN, BERNARD
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TALLACKSON, J. R.
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ORNL/TM-6626/V1 1187

TANAKA, M. P.
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TANG, ZHAOYOU
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TANGE, T.
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TAO, WENYUAN
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TARBELL, SUSAN A.
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TARVID, G. V.
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TAUSSIG, R.
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TAYLOR, CAROL A.
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TAYLOR, CHARLES E.
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TAYLOR, JOHN N.
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TAYLOR, JUDITH
Physicians and Financial Incentives,
PB82-133695 1132

TAYLOR, N. B.
Determining Optimum Routes from Maps,
PB82-135310 1214

TAYLOR, RONALD G.
Size and Sex Ratio of King Mackerel, 'Scomberomorus cavalla', in the Southeastern United States.
PB82-109406 1121

TEICH, MALVIN CARL
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TEKINER, AHMET C.
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TEMPORAL, J.
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TENNERY, V. J.
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TERASHIMA, Y.
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TERMAATH, STEPHEN GRANT
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TESARIK, D. R.
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THARR, DAWN GILLES
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THEIS, G. L.
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PB82-136649 1121

Decapsulation of Brine Shrimp ('Artemia salina') Cysts,
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Degassing Supersaturated Water for Fish Culture,
PB82-136623 1121

Electronically-Controlled Automatic Live-Food Feeder,
PB82-136656 1122

Handling and Transporting Juvenile American Shad,
PB82-136615 1121

Intensive Culture of Walleye ('Stizostedion vitreum vitreum'),
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THEISS, J. M.
Gas Levitator and Method for Containerless Processing.
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THIBODEAU, LAWRENCE A.
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THIBODEAU, THOMAS
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PB82-144486 1116

THIELEN, C. J.
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THIEME, L. G.
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THIMONS, EDWARD D.
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The Water Spray Cooler - An Update.
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THOMAS, G. J.
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Cultural Resources Investigations at Redstone Arsenal, Madison County, Alabama. Volume II.
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THOMAS, R. L.
Laser Photoacoustic Technique for NDE.
AD-A107 388/1 1228

THOMAS, R. N.
Preparation of Large-Diameter GaAs Crystals.
AD-A107 395/6 1252

THOMASSON, J. F.
Radiation Testing of Composite Materials, in Situ Versus Ex Situ Effects.
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Influence of Irradiation on the Tensile Properties of Austenitic Stainless Steel Weldments.
DE81032002 1221

WIGGINS, CARL

Evaluation of Spatial Filtering as a Means for Increasing Optical Performance in High Power Beam Trains.
AD-A107 164/6 1256

WILCOCK, D. F.

Preliminary Study of Temperature Measurement Techniques for Stirling Engine Reciprocating Seals.
N82-11466/1 1271

WILKEN, GENE C.

Catalog of Holdings and Other References in the Lesotho MOA/LASA Library.
PB82-133133 1096

Profiles of Basotho Farmers. Part I: Images of Basotho Farmers. Part II: Are the Basotho Subsistence Farmers. Part III: Progressive Farmers in Lesotho.
PB82-132762 1109

WILKES, F. G.

Marine and Estuarine Pollution.
PB82-128174 1136

WILLENS, C. A.

Utilization of Geothermal Energy in the Mining and Processing of Tungsten Ore. 2ND Quarterly Report.
DOE/ET/27232-T4 1162

WILLIAMS, A. M.

Training Improvements for the Tactical Aircrew Training System (TACTS): Project Summary Report.
AD-A107 003/6 1107

WILLIAMS, CARROLL B. JR.

Field Evaluation of Phloem-Mobile Acephate for Suppression of Southern Pine Beetle.
PB82-134479 1082

WILLIAMS, D. E.

Weldability of Thermally Grain-Refined Fe-12Ni-0.25Ti for Cryogenic Structural Applications.
LBL-10259 1192

WILLIAMS, DONALD L.

Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume I,
PB82-131426 1211

Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume II,
PB82-131434 1211

WILLIAMS, R. C.

Low Speed Testing of the Inlets Designed for a Tamden-Fan V/STOL Nacelle.
N82-11042/0 1077

WILLIAMS, R. E.

Directional Drilling Equipment and Techniques for Deep Hot Granite Wells.
LA-UR-80-2086 1165

WILLIAMS, RAYMOND

Financial Profile of 15 New Agricultural Marketing Cooperatives,
PB82-131202 1080

WILLIAMS, ROY O.

Size and Sex Ratio of King Mackerel, 'Scomberomorus cavalla', in the Southeastern United States.
PB82-109406 1121

WILLINGHAM, C. E.

Radiation Dose Rates from Commercial PWR and BWR Spent Fuel Elements.
DE82000697 1246

WILLIS, DELORES D.

Approved Prescription Drug Products with Therapeutic Equivalence Evaluations.
PB82-129164 1141

WILLIS, JOHN E.

Ignition of Composite Propellants under Rapid Pressure Loading.
AD-A107 147/1 1271

WILLSHIRE, W. L. JR.

SEL and EPNL Noise Duration Coefficients for the 747 and T-38 Aircraft.
N82-11860/5 1078

WILMOTH, R. G.

Computation of High Reynolds Number Internal/External Flows.
N82-11046/1 1254

WILMSEN, C. W.

Effects of a Thin SiO2 Layer on the Formation of Metal-Silicon Contacts.
AD-A107 121/6 1263

WILSON, GARY R.

Covariance Functions and Related Statistical Properties of Acoustic Backscattering from a Randomly Rough Air-Water Interface.
AD-A107 169/5 1252

WILSON, S. R.

Cocurrent Three-Phase Fluidized Bed. Part 2.
ORNL-MIT-213 1265

WILSON, SANDRA REITZ

Synthesis of Recent Research on Medical Career Decisions: A Comparative Study of Physicians from Two Decades. Executive Summary and Final Report.
PB82-133737 1110

WINDISCH, CHARLES F.

Vibrational Spectra of Oxygen- and Boron-Isotopically Substituted B2O3 Glasses.
AD-A107 333/7 1189

WINER, W. O.

Preliminary Study of Temperature Measurement Techniques for Stirling Engine Reciprocating Seals.
N82-11466/1 1271

WINN, K. R.

Excited-State Proton Transfer Kinetics in 1-Naphthol Compounds and Organometallic Complexes.
LA-UR-80-1928 1151

WINOGRAD, N.

Energy and Angle Resolve SIMS Studies of CO on Ni(001).
AD-A107 474/9 1149

WINSOR, N. K.

Tokamak Heating and Current Maintenance with Intense Pulsed Ion Beams.
NRL-MR-4213 1240

WINTER, K. G.

The Design of a 'Jet Catcher'.
AD-A106 968/1 1253

WISE, LAURESS L.

Synthesis of Recent Research on Medical Career Decisions: A Comparative Study of Physicians from Two Decades. Executive Summary and Final Report.
PB82-133737 1110

WISE, R. L.

Proceedings of the Second Annual Methane Recovery from Coal Beds Symposium.
METC/SP-79/9 1166

WISE, STEPHEN A.

Pilot Program for the National Environmental Specimen Bank. Phase I.
PB82-133943 1132

WISSEMAN, CHARLES L. JR.
Epidemiologic Study of Rocky Mountain Fever (RMSF).
PB82-115932 1131

WITHERS, RICHARD S.
MNOS/CCD Nonvolatile Analog Memory.
AD-A107 229/7 1172

WITT, A. F.
Growth of Solid Solution Single Crystals.
N82-11958/7 1253

WITTIG, L. E.
Railroad Yard Simulation Model: Description and Computer Program Users' Manual.
PB82-138686 1222

WITTING, JAMES M.
High Solitary Waves in Water: A Refined Numerical Method.
AD-A107 041/6 1156

High Solitary Waves in Water: Results of Calculations,
AD-A107 267/7 1253

WITTMANN, F. H.
Stochastic Approach to Study the Influence of Rate of Loading on Strength of Concrete,
PB82-132135 1219

WITUS, GARY
Guidelines for Managing the Flow of Information in an Automated Battlefield Command and Control System.
AD-A107 297/4 1233

WNEK, GARY E.
Soliton Formation and cis trans Isomerization in Polyacetylene.
AD-A107 274/3 1195

WOLFE, A. D.
Preferential Inhibition of Ribonucleic Acid Synthesis by a New Thiosemicarbazone Possessing Antibacterial and Antiparasitic Properties.
AD-A106 951/7 1141

WOLFE, MARVIN L.
The Activity Fuel Appraisal Process: Instructions and Examples.
PB82-107319 1081

WOLSKY, A. M.
Inferred Referendum and Its Comparison with Borda Voting.
DE82000170 1103

WOLTON, I.
A Wake Source Model for Asymmetric Potential Flow past Bodies of Wedge Shape.
N82-11036/2 1254

A Wake Source Model for Non-Symmetric Flow past Bluff Bodies in Two-Dimensional Flow.
N82-11037/0 1076

WOOD, VAN E.
Study of the Two-Photon Photorefractive Effect in Lithium Niobate.
AD-A107 493/9 1256

WOODRICK, ANNE
Archaeological Investigation in the Gainesville Lake Area of the Tennessee-Tombigbee Waterway. Volume IV. Biocultural Studies in the Gainesville Lake Area.
AD-A107 171/1 1103

WOODWARD, J. H.
Modification of Laser Rangefinder MX-9838( )/GVS-5 Into a Visioceilometer Optical Unit.
AD-A107 099/4 1227

WOON, ROBERT P.
Supply Workload Implications of Increased Deployment to the Indian Ocean.
AD-A106 994/7 1230

WOOSLEY, S. E.
Thermonuclear Model for gamma -Ray Bursts.
DE81030835 1082

WORKMAN, G. L.
Space Processing of Electronic Materials.
N82-11094/1 1222

WORMS, F.
Effects of Curative Treatment Emphasizing Endurance Training on the Performance and Blood Pressure of Hypertensive and Normotensives.
N82-11771/4 1144

WRIGHT, JAMES E.
Isometric, Isotonic, and Isokinetic Torque Variations in Four Muscle Groups through a Range of Joint Motion,
AD-A107 324/6 1142

WRIGHT, JANET S.
Terrain Analysis Procedural Guide for Soil. Report Number 6 in the ETL Series on Guides for Army Terrain Analysts.
AD-A107 048/1 1156

WRIGHT, R. Q.
Comparison of the ENDF/B-V and SOKRATOR Evaluations of exp 235 U, exp 239 Pu, exp 240 Pu and exp 241 Pu at Low Neutron Energies.
DE81032037 1258

WRIGHTON, MARK S.
Electrostatic Binding of Electroactive and Non-Electroactive Anions in a Surface-Confined, Electroactive Polymer: Selectivity of Binding Measured by Auger Spectroscopy and Cyclic Voltammetry.
AD-A106 928/5 1148

WU, A.
Integrated Traffic Simulation Model - Phase I. Volume 4: Revisions to UTCS-1 Traffic Simulation Model to Enhance Operational Effectiveness.
PB82-139189 1216

WU, LILI
Determination of Estrogen Receptor in Human Colon Cancer Tissue with Labeled Fluorescence Estradiol (Fluorescein Isothiocyanate),
PB82-129719 1131

WUEST, MICHAEL R.
The Air-Launched Balloon System (ALBS) Phase II Design Improvement and Test Program.
AD-A107 214/9 1077

WUNSCH, P. K.
Investigation of Direct Solar-to-Microwave Energy Conversion Techniques.
N82-11544/5 1186

WYANT, KERRY W.
USAF Food Habits Study. Part IV. Selections, Quantities Selected, and Perceived Portion Sizes.
AD-A107 307/1 1137

WYART, J. F.
The 4f(13)5f Configuration in the Isoelectronic Sequence of Yb III.
PB82-137407 1153

WYATT, R. C.
Proton Upsets in LSI Memories in Space.
AD-A107 331/1 1173

XU, SHIZHENG
A New Method for Determination of Anti-Double Strand DNA Antibodies, Trypanosoma Equiperdium Immunofluorescent Method,
PB82-129636 1131

XU, YANHE
Influence of Late-Pregnancy Toxemia on the Fetus,
PB82-136045 1133

YAMADA, H.
Application of a Rare-Earth Cobalt Magnet to Synchronous Motors.
N82-11358/0 1171

YAMAKAWA, K. A.
The Effects of Impurities on the Performance of Silicon Solar Cells.
N82-11548/6 1187

YANCIK, RICHARD F.
The Activity Fuel Appraisal Process: Instructions and Examples.
PB82-107319 1081

YANIV, SIMONE L.
Effects of Time-Varying Noise on Annoyance: A Review,
PB82-133513 1112

YAO, J. T. P.
Inference Procedure with Uncertainty for Problem Reduction Method,
PB82-131772 1198

YAO, KUNG
Quadratic-Exponential Moment Error Bounds for Digital Communication Systems.
AD-A106 906/1 1233

YAO, SHI-CHUNE
Boiling Heat Transfer in Confined Space.
AD-A107 363/4 1200

YARBA, V. A.
Hyperfragment Production in Proton-Nucleus Interactions at 70 and 250 GeV.
JINR-R-1-12315 1258

YBARRA, A. H.
Low Speed Testing of the Inlets Designed for a Tamden-Fan V/STOL Nacelle.
N82-11042/0 1077

YEGOROV, I. A.
Cyclic Nucleotides in Tissues During Long-Term Hypokinesia.
N82-11757/3 1144

YERGEY, A. L.
Fundamentals of Ion Motion in Electric Radiofrequency Multipole Fields.
AD-A107 243/8 1253

YIN, L. I.
Real-Time 3D X-Ray and gamma-Ray Viewer.
PAT-APPL-6-267 178 1179

YIP, L. P.
Effects of Vortex Flaps on the Low-Speed Aerodynamic Characteristics of an Arrow Wing.
N82-11013/1 1077

YODER, C. F.
The Tides of Io.
PB82-133927 1083

YORK, D. A.
DOE-2 Reference Manual.
LA-7689-M(Ver.2.1)(Pt.1) 1181

YOSHIDA, T.
New Molding Method of Three-Dimensional Hollow Photoelastic Model and Centrifugal Stress Analysis of Air Cooled Turbine Blade Model.
N82-11067/7 1270

YOUNG, A. J.
Prediction of Energy Expenditure during Load Carriage at High Altitude.
AD-A106 852/7 1143

YOUNG, JAMES S.
Baseline Study of Effects of Ionizing Radiation on the Chromosomes of the Marine Worm, 'Neanthes arenaceodentata'.
PB82-131517 1143

YOUNG, P. G.
Applied Nuclear Data Research and Development. Progress Report, January 1-March 31, 1980.
LA-8418-PR 1260

Applied Nuclear Data Research and Development. Progress Report, October 1-December 31, 1979.
LA-8298-PR 1260

YOUNG, S. J.
SYCOL: A High Level Language for Applications in Real Time Control Systems,
PB82-135666 1176

SYCOL: Informal Language Specification,
PB82-135658 1176

YOUNG, T. S.
Polymer Impregnated Concrete and Polymer Concrete Overlays. Volume I.
PB82-133661 1220

YOUNGER, S. M.
Cross Sections and Rates for Direct Electron-Impact Ionization of Sodiumlike Ions.
PB82-137340 1153

Electron Impact Ionization Cross Sections and Rates for Highly Ionized Atoms.
PB82-137357 1153

Electron-Impact-Ionization Cross Sections and Rates for Highly Ionized Berylliumlike Ions.
PB82-137332 1153

YOUROUKOS, EVANGELOS VLASSIOS
Steady/Oscillatory, Supersonic/Hypersonic Inviscid Flow Past Oscillating Wings and Wedge Combinations at Arbitrary Angles of Attack.
AD-A107 438/4 1076

YU, F. T. S.
Optical Processing of Photographic Images.
AD-A107 212/3 1230

YU, K.
Geothermal Energy Development in the Eastern United States. Technical Assistance Report No. 4. Geothermal Space Heating: Pittsville Middle/Elementary School, Pittsville, Maryland.
JHU/APL-QM-80-101 1201

YU, KWANG
BIGMAC: Basic Interactive Geothermal Model with Aquifer Characterization; A User's Guide,
PB82-128679 1183

YUAN, W.
Isotope Effect in Gas-Surface Vibrational Energy Transfer. Cyclopropane and Cyclopropane-d6 Isomerization by the VEM Technique.
AD-A107 365/9 1149

YUE, D. D.
Station Blackout at Browns Ferry Unit One - Accident Sequence Analysis,
NUREG/CR-2182-V1 1248

YUNG, F.
FFTF MOTA: Design Thermal and Stress Overcheck Analyses.
DE81027367 1247

ZABEL, H.
Lattice Dynamics of Graphite Intercalation Compounds: Modelled by the Phonon Dispersion of Linear Chains.
DE82000061 1151

Phonons in Alkali Graphite Intercalation Compounds.
DE82000059 1151

Thermal Expansion of Alkali-Graphite Intercalation Compounds.
DE82000060 1151

ZACK, LINDA S.
Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume V: Public Regulation,
PB82-144361 1100

ZAHORCHAK, A. F.
Establishment of Production Techniques for Transducer Acoustic Delay Lines on a Pilot Line Basis.
AD-A107 339/4 1178

ZAJTCHUK, ROSTIK
An Analysis of the Isoenzymes of Creatine Phosphokinase and Lactic Dehydrogenase in the Esophagus.

AD-A107 101/8 1120

ZAK, ADAM R.

Automatic Input Data Generation for ADINA and NASTRAN Structural Computer Codes.
AD-A107 534/0 1262

ZAKIAN, V.

Computation of Abscissa of Stability by Repeated Use of the Routh Test,
PB82-134800 1199

New Formulations for the Method of Inequalities,
PB82-135625 1199

ZAMAN, PAUL R.

National Dam Safety Program. No Name 165 (Crystal Lake Dam) (MO 10580), Missouri - Kansas City Basin, Jackson County, Missouri. Phase I Inspection Report.
AD-A107 542/3 1208

ZANON, DANIELA

Model for the Hadron-Hadron Vertex: Dynamic Origin of the OZI Rule.
PB82-137381 1260

ZARE, RICHARD N.

Research on Metal Halide Laser Systems.
AD-A107 398/0 1255

ZAWACKI, THOMAS S.

Development and Field Verification of a Model of House Air Infiltration for Single Family Residences.
PB82-141110 1226

ZEBKER, H. A.

Synthetic Aperture Radar Target Simulator.
PAT-APPL-6-284 287 1238

ZEH, JUDITH E.

Evaluation of Existing Marine Intertidal and Shallow Subtidal Biologic Data,
PB82-134065 1155

ZEISLER, ROLF

Pilot Program for the National Environmental Specimen Bank. Phase I.
PB82-133943 1132

ZEWEKH, P. S.

Optical Fiber Interferometer for the Study of Ultrasonic Waves in Composite Materials.
N82-11121/2 1191

ZHANG, HAOYAN

Studies on the Rapid Detection of Dengue Virus Antigen by Immunofluorescence and Radioimmunoassay,
PB82-136052 1133

ZHANG, YIWEN

Clinical Analysis of 120 Cases of Primary Amenorrhea,
PB82-136037 1133

ZHI, GAO

Selected Articles--Translation.
AD-A107 322/0 1077

ZHONG, HUILAN

Present Situation of Filariasis in China,
PB82-129651 1131

ZHOU, XIANTING

Case of Hereditary (4;5) Translocation Discovered Prenatally,
PB82-129693 1131

ZHU, NANYING

Determination of Estrogen Receptor in Human Colon Cancer Tissue with Labeled Fluorescence Estradiol (Fluorescein Isothiocyanate),
PB82-129719 1131

ZIELINSKI, R. E.

Evaluation of Resource-Assessment Values and in-Situ Combustion Potential for the OH-4 and PA-3 Wells. Final Report.
DE82000388 1157

Princetown I Data Analysis.
MLM-2731(OP) 1268

ZIEN, HERBERT B.

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume II. The Mobile Home Production System,
PB82-144338 1100

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume III: The Mobile Home Distribution System,
PB82-144346 1100

Structure, Operation, Performance, and Development Trends of the Mobile Home Industry. Volume IV: The Mobile Home Park System,
PB82-144353 1100

ZOLLER, P.

Bifurcations and Multistability in Two-photon Processes.
PB82-133901 1152

ZOLNAY, STEPHEN L.

Technology Assessment for Future EHF MILSATCOM Systems.
AD-A107 059/8 1233

ZONG, LIU XUE

Selected Articles--Translation.
AD-A107 322/0 1077

ZOU, RONGBI

Determination of Estrogen Receptor in Human Colon Cancer Tissue with Labeled Fluorescence Estradiol (Fluorescein Isothiocyanate),
PB82-129719 1131

ZUO, WEI DE YUAN

China's Ballistic Missile Plans--Translation.
AD-A107 426/9 1232

ZWEIDINGER, RUTH A.

Treatability Studies of Pesticide Manufacturing Wastewaters: Ethylenebisdithiocarbamate Fungicides.
PB82-107566 1210

ZWISSLER, J. G.

Fracture Mechanics of Cellular Glass.
N82-11209/5 1189

CORPORATE AUTHOR INDEX

NTIS®

In this index, the name of the company, university, or government agency that performed the research or prepared the report is listed. Entries are arranged first by the organization's name, then alphanumerically by the performing organization report or series number. If no report or series number is included, the subarrangement is by NTIS order number.

SAMPLE ENTRY

MASSACHUSETTS INST. OF TECH., CAMBRIDGE CONSTRUCTED FACILITES DIV.
R79-12
Computation of Hankel Transforms Using the Fast-Fourier Transform Algorithm,
(NSF/RA-790206)
PB80-104045 33

Corporate or Performing organization

Report or series number
Title

(Sponsor's report or series number)
NTIS order number Page number

ABT ASSOCIATES, INC., CAMBRIDGE, MA.

AAI-78/133
Housing Deprivation Among Enrollees in the Housing Allowance Demand Experiment,
(HUD-0001839)
PB82-144411 1115

AAI-80/61
Housing Allowance Demand Experiment: Final Report,
(HUD-0002137)
PB82-145020 1119

An Analysis of the Scope of Federal Laws and Regulations Controlling Exposures to Substances Which Cause Occupational Respiratory and Pulmonary Diseases.
(ASPER/CON-78/0153/A)
PB82-134198 1103

ACADEMIA SINICA, BEIJING (CHINA). INST. OF GENETICS.

Case of Hereditary (4;5) Translocation Discovered Prenatally,
PB82-129693 1131

ACADEMY OF HEALTH SCIENCES (ARMY), FORT SAM HOUSTON, TX. DENTAL STUDIES OFFICE.

81-013
Evaluation of the Effectiveness and Efficiency of Preventive Dentistry Programs: Assessment of the Relationship between Past Dental Experience and Dental Sick Call in the Field.
AD-A107 506/8 1124

ACADEMY OF HEALTH SCIENCES (ARMY), FORT SAM HOUSTON, TX. HEALTH CARE STUDIES DIV.

HCSD-81-002
Flexitime in an Army Medical Center.
AD-A107 470/7 1109

HCSD-81-003
Teleradiology.
AD-A107 431/9 1123

HCSD-81-004
An Assessment of the Dental Needs of Army Recruits.
AD-A107 290/9 1123

HCSD-81-014
Field Unit Readiness Study (FURS).
AD-A107 469/9 1109

ACKCO, INC., BOULDER, CO.

American Indian Jobs/Skills Bank.
(HUD-0002053)
PB82-144478 1111

ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT, NEUILLY-SUR-SEINE (FRANCE).

AGARD-AG-160-VOL-13
AGARD Flight Test Instrumentation Series. Volume 13. Practical Aspects of Instrumentation System Installation,
AD-A107 355/0 1077

AGARD-AG-251
Theory and Applications of Optimal Control in Aerospace Systems,
AD-A106 937/6 1078

AGARD-CP-312
The Impact of New Guidance and Control Systems on Military Aircraft Cockpit Design.
AD-A107 356/8 1079

AEROJET ENERGY CONVERSION CO., SACRAMENTO, CA.

High-Temperature-Staged Fluidized-Bed Combustion (HITS), Bench Scale Experimental Test Program Conducted During 1980. Final Report.
DOE/ET/15167-191 1265

AERONAUTICAL RESEARCH ASSOCIATES OF PRINCETON, INC., NJ.

ARAP-450
Atmospheric Fluctuations Which Lead to Trackable Radar Signals in the Marine Boundary Layer.
AD-A107 523/3 1238

AERONAUTICAL RESEARCH INST. OF SWEDEN, STOCKHOLM.

FFA-134
A Two-Dimensional Study of the Maximum Power That Can Be Obtained from a Wind Turbine in a Wind Shear Layer,
PB82-136987 1187

AGENCY FOR INTERNATIONAL DEVELOPMENT, TEGUCIGALPA (HONDURAS).

PN-AAH-878
Assessment of the Public Health Sector in Honduras, 1975-1985.
PB82-131095 1131

AGENCY FOR INTERNATIONAL DEVELOPMENT, WASHINGTON, DC.

AID-PN-AAJ-199
Jamaica Feeder Roads: An Evaluation.
PB82-133802 1213

AGRICULTURAL COOPERATIVE SERVICE, WASHINGTON, DC.

ACS/RR-2
Ship Chartering Alternatives for Grain-Exporting Cooperatives.
PB82-130881 1098

ACS-SR-1
Attitudes Toward Cooperatives by Bank Trust and Professional Farm Managers,
PB82-131244 1080

ACS/SR-2
Financial Profile of 15 New Agricultural Marketing Cooperatives,
PB82-131202 1080

ACS/SR-3
Cooperative Farm Machinery Operations: Oregon and Wisconsin,
PB82-134123 1080

CORPORATE AUTHOR INDEX

ACS/SR-5
Vacation Farm Cooperatives,
PB82-134388 1080

AIA RESEARCH CORP., WASHINGTON, DC.

Survey of Passive Solar Buildings.
(HUD-0002080, HUD/PDR-287(2))
PB82-144684 1203

AIR FORCE ACADEMY, CO.

USAFA-TR-80-5
Digital Signal Sorting for Digitized Speech in an Environment of Common Digital Data Signals.
AD-A107 266/9 1233

AIR FORCE DATA SYSTEMS DESIGN CENTER, GUNTER AFS, AL.

AFM-171-714-VOL-1
Selective Inquiry System (SIS). Operation Manual and Users Manual.
(DOD/DF-81/017a)
AD-A107 300/6 1173

Selective Inquiry System/Timesharing Retrieval Subsystem.
(DOD/DF-81/017)
AD-A107 299/0 1173

AIR FORCE GEOPHYSICS LAB., HANSCOM AFB, MA.

AFGL-TR-81-0295
Attenuation Problems Associated with a 5 cm Radar.
AD-A107 215/6 1238

AFGL-TR-81-0296
Measurements of Structural Features in Profiles of Mesospheric Density.
AD-A107 330/3 1084

AFGL-TR-81-0297
Some Unique Applications for Tethered Balloon Systems,
AD-A107 292/5 1077

AFGL-TR-81-0298
Empirical F-Region Model Development Based on S3-1 Satellite Measurements,
AD-A107 403/8 1084

AFGL-TR-81-0310
The Air-Launched Balloon System (ALBS) Phase II Design Improvement and Test Program.
AD-A107 214/9 1077

AFGL-TR-81-0320
Limiting Payload Deceleration during Ground Impact,
AD-A107 371/7 1251

AIR FORCE INST. OF TECH., WRIGHT-PATTERSON AFB, OH.

AFIT-CI-79-212D
Mechanisms of Recovering Low Cycle Fatigue Damage in Incoloy 901.
AD-A107 255/2 1192

AFIT-CI-79-213D
Analysis of Flow Behavior Within An Integrated Computer-Communication Network,
AD-A107 254/5 1233

AFIT-CI-79-252T
Determination of the Relationship between Information Capacity and Identification by Simulated Aerial Photography.
AD-A107 485/5 1230

AFIT-CI-79-254T
Identification of Wheelset/Rail Creep Coefficients from Dynamic Response Data Using the Maximum Likelihood Parameter Identification Technique.
AD-A107 447/5 1221

AFIT-CI-79-269D
Topographically Induced Diurnal Boundary Layer Oscillations: Two Dimensional Synoptic Scale Modeling.
AD-A107 199/2 1086

AFIT-CI-79-300T-S
Feline Malignant Lymphoma: A Multiway Frequency Analysis of a Population Involving Sex, Age, Cell Type, and Tumor Location.
AD-A106 825/3 1122

AFIT-CI-79-302T-S
Testing of RPMI-1640 as a Nutrient Medium for Fresh Semilunar Valve Storage.
AD-A106 824/6 1140

AFIT-CI-79-304D-S
The Effects of Diet Calcium, Protein and Acidity on Calcium Retention in the Rat, Particularly as Related to the Inner and Outer Surfaces of Tubular Bons: A Possible Model for the Treatment or Prevention of Osteoporosis.
AD-A107 200/8 1123

AFIT-CI-79-305D-S
A Statistical Methodology for Constructing Synthetic Test Workloads.
AD-A107 257/8 1172

AFIT-CI-79-307D-S
Evaluation of Gamma Radiation for Destruction of Pentachlorophenol in Aqueous Solution and on Activated Carbon.
AD-A106 943/4 1154

AFIT-CI-79-308T
Fathering and the Pediatric Cancer Experience.
AD-A106 945/9 1122

AFIT-CI-79-317-T-S
Standardization of Map Symbology for Large Scale Maps.
AD-A107 448/3 1156

AFIT-CI-81-9D
The Determinants of Career Decisions of Air Force Pilots.
AD-A107 265/1 1108

AFIT-CI-81-10T
Office of Management and Budget Circular Number A-76 as a Statement of Federal Procurement Policy.
AD-A107 259/4 1089

AFIT-CI-81-12D
Automatic Microwave Network Analyzer Calibration by Reference to a Transmission-Line Standard with Applications to Characterization of Adapters, Devices, and Coaxial Lines with SMA Connectors.
AD-A107 198/4 1227

AFIT-CI-81-15D
Structural Design of a Large Deformable Primary Mirror for a Space Telescope.
AD-A107 260/2 1256

AFIT-CI-81-26D
Control of Air Pollution from Aviation: The Emission Standard Setting Process.
AD-A107 435/0 1208

AFIT-CI-81-36T
Determination of Ice Crystal Growth Parameters in a Supercooled Cloud Tunnel.
AD-A107 263/6 1084

AFIT-CI-81-37T
Efficient Radiative Transfer Computations in the Atmosphere.
AD-A107 289/1 1084

AFIT-CI-81-44D
A Computational Study of the Modification of Raindrop Size Distributions in Subcloud Downdrafts.
AD-A107 262/8 1084

AFIT-CI-81-50D
The Single and Multiple Vehicle Pickup and Delivery Problem: Exact and Heuristic Algorithms.
AD-A107 202/4 1199

AFIT-CI-81-54D
Long and Short-Term Memory Processes in Cortically Damaged Patients.
AD-A107 258/6 1123

AFIT-CI-81-55T
Digital Command Augmentation for Lateral-Directional Aircraft Dynamics.
AD-A107 264/4 1079

AIR FORCE INST. OF TECH., WRIGHT-PATTERSON AFB, OH. SCHOOL OF ENGINEERING.

AFIT/AE/DS79-1
An Investigation of Flame Stability in a Coaxial Dump Combustor.
(AFIT-CI-79-215D)
AD-A107 256/0 1264

AFIT/DS/AA/79M-1
Prediction of Aerodynamic Forces on a Circular Cylinder and a Thin Airfoil in a Transonic Airstream by the Finite Element Method.
(AFIT-CI-79-216D)
AD-A107 201/6 1076

AIR FORCE INST. OF TECH., WRIGHT-PATTERSON AFB, OH. SCHOOL OF SYSTEMS AND LOGISTICS.

AFIT-LSSR-17-81
Implementation of Subcontracting Provisions of Public Law 95-507 within Air Force Logistics Command and Air Force Systems Command.
AD-A107 450/9 1090

AFIT-LSSR-27-81
Determination of Contract Suitability to the Award Fee Concept.
AD-A107 465/7 1090

AFIT-LSSR-40-81
An Examination of Year-End Spending with Regard to Department of Defense Contract Awards.
AD-A107 033/3 1089

AU-AFIT-LS-5-81
Effect of Work Schedule, and Description of Career Intention on Organizational Effectiveness.
AD-A106 819/6 1105

AU-AFIT-LS-6-81
Effect of Number Supervised and Educational Level on Organizational Effectiveness.
AD-A106 820/4 1105

AIR FORCE OCCUPATIONAL MEASUREMENT CENTER, RANDOLPH AFB, TX.

Avionic Communications and Avionic Navigation Systems Specialties AFS 328X0 and 328X1.
AD-A107 115/8 1107

Airborne Communication Systems Career Ladder, AFSC 294X0.
AD-A107 472/3 1109

Fuels Career Ladder AFSC 631X0.
AD-A107 473/1 1109

AIR FORCE SYSTEMS COMMAND, WASHINGTON, DC.

AFSC-TR-81-64-SUPPL
Continental United States Over-The-Horizon-Backscatter (OTH-B) Radar System. Supplement.
AD-A106 870/9 1237

AIR FORCE WRIGHT AERONAUTICAL LABS., WRIGHT-PATTERSON AFB, OH.

AFWAL-TR-81-1238
Trap Studies on GaAs-Si3N4 Interfaces.
AD-A106 990/5 1263

AIR WAR COLL., MAXWELL AFB, AL.

MS094-81
U.S. Technology Transfer to the Soviet Union: A Dilemma.
AD-A107 313/9 1090

MS108-81
Air War College Class of 1981 Retention Survey.
AD-A107 103/4 1107

MS114-81
Performance as a Factor in Enlisted Promotions.
AD-A107 298/2 1108

AIRESEARCH MFG. CO. OF ARIZONA, PHOENIX.

DOE/SF/01123-T57
Executive Summary: Brayton Isotope Power System.
DE81027473 1249

ALABAMA UNIV. IN HUNTSVILLE. KENNETH E. JOHNSON ENVIRONMENTAL AND ENERGY CENTER.

DOE/CS/30013-T3
Rate Guide for Residential No. 2 Heating Oil and Coal for SOLCOST Data Bank Cities.
DE82000483 1268

DOE/CS/30013-T4
Utility Rate Guide for SOLCOST Data Bank Cities.
DE82000468 1268

ALABAMA UNIV., UNIVERSITY. DEPT. OF CHEMISTRY.

Synthesis, Radiation Degradation, and Electron Beam Resist Behavior of Fluorine-Containing Vinyl Polymers.
(ARO-16201.6-C)
AD-A106 913/7 1194

ALABAMA UNIV., UNIVERSITY. OFFICE OF ARCHAEOLOGICAL RESEARCH.

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AD-A107 171/1 1103

ALUMINUM CO. OF AMERICA, PITTSBURGH, PA.

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LA-7885-MS(V.3) 1188

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(HUD-0002136)
PB82-145012 1119

AMERICAN GAS ASSOCIATION LABS., CLEVELAND, OH.

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(GRI-80/0079.1)
PB82-141060 1202

Application of Intermittent Ignition Devices to Commercial Cooking Equipment.
(GRI-78/0050)
PB82-141078 1138

Commercial Cooking Equipment Improvement.
(GRI-80/0080)
PB82-141094 1138

AMERICAN INSTITUTES FOR RESEARCH, PALO ALTO, CA.

Synthesis of Recent Research on Medical Career Decisions: A Comparative Study of Physicians from Two Decades. Executive Summary and Final Report.
(NCHSR-81-232)
PB82-133737 1110

AMERICAN PUBLIC HEALTH ASSOCIATION, WASHINGTON, DC.

Third Evaluation of the Thailand National Family Planning Program.
(AID-PN-AAJ-314)
PB82-131491 1114

AMERICAN PUBLIC WELFARE ASSOCIATION, WASHINGTON, DC.

Federal Regulations, Statutes, and Reporting Requirements as Barriers to Efficient Medicaid Program Operations,
PB82-133711 1132

AMERICAN UNIV., WASHINGTON, DC. INST. FOR APPLIED PUBLIC FINANCIAL MANAGEMENT.

131-80-VIII
An Evaluation of Farmers Home Administration's Economic Emergency Loan Program Objectives to Determine the Programs Effectiveness and the Need for the Program.
PB82-134727 1092

AMES LAB., IA.

CONF-7906147-1
Passive Design Tutorial.
ISM-227 1201

Neutron-Capture gamma-Ray Analysis of Coal for Sulfur, Iron, Silicon and Moisture.
IS-T-847 1165

ANALYTICAL MECHANICS ASSOCIATES, INC., HAMPTON, VA.

AMA-81-25
An Influence Coefficient Method for the Application of the Modal Technique to Wing Flutter Suppression of the Dast Arw-1 Wing.
N82-11070/1 1078

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N82-11070/1 1078

ANCO ENGINEERS, INC., CULVER CITY, CA.

Gerrnan Standard Problem 4a.
NUREG/CR-2390 1248

APPLIED CONCEPTS CORP., RESTON, VA.

A Study of Metric Conversion of Distilled Spirits Containers: A Policy and Planning Evaluation: Task I. Comprehensive Report on the Conversion Process,
PB82-134396 1099

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G-124
Comparison of the Caries-Preventive Effects of Neutral Sodium Fluoride and Acidulated Phosphate Fluoride.
(NIDR/CR-81-09)
PB82-135203 1132

ARGONNE NATIONAL LAB., IL.

ANL/CNSV-TM-78
Waste-to-Energy Systems Institutional Barriers Assessment Workshop.
DE82000098 1267

ANL/EES-TM-148
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ANL/EES-TM-152
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ANL/SPG-19
Inferred Referendum and Its Comparison with Borda Voting.
DE82000170 1103

ANL-80-115-Pt.3
Radiological and Environmental Research Division Annual Report, January-December 1980: Ecology.
DE82000154 1136

ANL-81-54
Boundary-Fitted Coordinate Transformation for Thermo-hydraulic Analysis in Arbitrary Three-Dimensional Geometries,
NUREG/CR-2313 1197

Review of Short-Term Screening Tests for Mutagens, Toxigens, and Carcinogens.
ANL/BIM-79-1 1144

Optimization of Radially Heterogenous 1000-MW(E) LMFBR Core Configurations. Appendix C. Research Project 620-25.
EPRI-NP-1000(V.3) 1247

ARGONNE NATIONAL LAB., IL. DIV. OF ENVIRONMENTAL IMPACT STUDIES.

Coal Combustion Waste Manual: Evaluating Impacts to Fish and Wildlife.
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PB82-141359 1216

ARIZONA UNIV., TUCSON. DIV. OF ECONOMIC AND BUSINESS RESEARCH.

Development of Compatible State - SMSA Econometric Models.
(NSF/SES-81005)
PB82-133497 1099

Development of Compatible State - SMSA Econometric Models: Appendices.
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PB82-133505 1099

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(NSF/RA-800368)
PB82-132168 1092

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When the Grand Tour's a Grind,
AD-A106 818/8 1143

ARMY ARMAMENT RESEARCH AND DEVELOPMENT COMMAND, ABERDEEN PROVING GROUND, MD. BALLISTIC RESEARCH LAB.

ARBRL-MR-03141
Shock Tube Tests of Muzzle Blast Transducers.
(AD-E430-701)
AD-A107 319/6 1251

ARBRL-MR-03142
A General Curvilinear Grid Generation Program for Projectile Configurations.
AD-A107 334/5 1250

ARBRL-TR-02370
Effectiveness Testing for Antipropagation Shields Developed for M456 Heat Tank Ammunition.
AD-A107 037/4 1250

ARBRL-TR-02371
Quantum-Mechanical Studies on Chemical Reactivity and Ballistic Chemistry. VII. Semiempirical Molecular Orbital Calculations and Experimental Studies on Relative Chemical Reactivities of Isomeric Tetrazole Derivatives, and their Relationship to the Explosive Properties of some Tetrazole Derivatives.
AD-A107 288/3 1250

ARBRL-TR-02373
Secondary Combustion in Gun Exhaust Flows.
AD-A107 312/1 1251

ARBRL-TR-02374
A Method of Determining the Turbulent Base Pressure in Uniform and Non-Uniform Supersonic Axisymmetric Flows.
AD-A107 318/8 1076

ARMY ARMAMENT RESEARCH AND DEVELOPMENT COMMAND, ABERDEEN PROVING GROUND, MD. CHEMICAL SYSTEMS LAB.

ARCSL-TR-81054
Evaluation of Replacement Red Smoke Dyes for 1-N Methylaminoanthraquinone.
AD-A107 286/7 1190

ARMY ARMAMENT RESEARCH AND DEVELOPMENT COMMAND, DOVER, NJ. LARGE CALIBER WEAPON SYSTEMS LAB.

ARLCD-TR-81035
Characterization of Pollutants at Holston Army Ammunition Plant.
(AD-E400-722)
AD-A107 340/2 1149

ARMY ARMAMENT RESEARCH AND DEVELOPMENT COMMAND, DOVER, NJ. TECHNICAL SUPPORT DIRECTORATE.

ARTSD-TR-81001
Simulation Testing of Weapon Systems.
(AD-E400-720)
AD-A106 821/2 1251

ARMY COMMUNICATIONS-ELECTRONICS ENGINEERING INSTALLATION AGENCY, FORT HUACHUCA, AZ.

USACEEIA-SEIP-036-1
Standard Engineering Installation Package. Air Traffic Radio Channel Control Equipment Change 1.
AD-A107 150/5 1236

ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND, WHITE SANDS MISSILE RANGE, NM. ATMOSPHERIC SCIENCES LAB.

ERADCOM/ASL-DR-1203A
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AD-A107 415/2 1086

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19304D MLRS, Missile Number BN-051, Round Number V-184/MD-40, 14 August 1981.
AD-A107 084/6 1085

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AD-A107 351/9 1086

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Effect of Hail, Snow, and Melting Hydrometeors on Millimeter Radio Waves.
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Techniques for the Computation of Wind, Ceiling, and Extinction Coefficient Using Currently Acquired RPV Data.
AD-A107 094/5 1085

ERADCOM/ASL-TR-0095
The Effect of Ionospheric Variability on the Accuracy of High Frequency Position Location.
AD-A107 425/1 1237

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AD-A107 087/9 1204

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R-81-8
Survivability--The Effort and the Payoff.
AD-A107 108/3 1230

ARMY ENGINEER TOPOGRAPHIC LABS., FORT BELVOIR, VA.

ETL-R026
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AD-A107 380/8 1156

ETL-0254
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Site Characterization for the MBCE/DIRT II Battlefield Environment Tests.
AD-A107 338/6 1236

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WES/TR/HL-81-9
Investigation of Release Temperatures for Kinzua Dam, Allegheny River, Pennsylvania. Hybrid Model Investigation.
AD-A106 974/9 1204

ARMY ENGINEER WATERWAYS EXPERIMENT STATION, VICKSBURG, MS. STRUCTURES LAB.

WES/MP/SL-81-27
Structural Stability Evaluation, Winnibigoshish Dam.
AD-A107 337/8 1205

WES/MP/SL-81-28
Tensile Tests on Articulated Concrete Mattress Specimens.
AD-A107 422/8 1218

WES/MP/SL-81-29
Evaluation of Tests for Determining the Pumpability of Concrete Mixtures.
AD-A107 524/1 1218

ARMY FIELD ARTILLERY SCHOOL, FORT SILL, OK.

SB-80
Terrorism; A Bibliography of Books and Periodical Articles.
AD-A107 291/7 1232

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Label Utility System.
(FSWEC-80/0109)
PB82-121831 1095

Label Utility System.
(FSWEC-80/0109-1)
PB82-121849 1095

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AD-A106 868/3 1088

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AD-A107 036/6 1123

Dental Emergencies Occurring among U.S. Army Recruits.
AD-A107 271/9 1123

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AD-A107 272/7 1123

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AD-A107 451/7 1231

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AMMRC-TR-81-48
Use of Titanium to Enhance Wetting of Reaction-Bonded Silicon Nitride by Silicon.
AD-A107 344/4 1190

ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND, ALEXANDRIA, VA.

DARCOM-P-706-314
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AD-A106 942/6 1194

ARMY MEDICAL BIOENGINEERING RESEARCH AND DEVELOPMENT LAB., FORT DETRICK, MD.

USAMBRDL-TR-8109
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AD-A107 242/0 1147

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AD-A106 955/8 1122

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AD-A106 957/4 1122

CORPORATE AUTHOR INDEX

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DRSMI-RE-81-6-TR
Signal Analysis Van Hardware Operation General Description. Volume 1.
(AD-E950-174)
AD-A106 948/3 1238

DRSMI-RE-81-19-TR
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(AD-E950-175)
AD-A106 947/5 1238

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Addition of Data Feature for FEASIL. Supplement.
AD-A106 992/1 1171

ARMY MOBILITY EQUIPMENT RESEARCH AND DEVELOPMENT COMMAND, FORT BELVOIR, VA.

MERADCOM-2332
Fundamentals of Ion Motion in Electric Radiofrequency Multipole Fields.
AD-A107 243/8 1253

MERADCOM-2333
Determination of Sodium Gluconate in Corrosion-Removing Compounds.
AD-A107 244/6 1149

ARMY NATICK RESEARCH AND DEVELOPMENT LABS., MA.

NATICK/TR-81/025
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AD-A107 307/1 1137

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PM TRADE-RE-0010
Simulated Tank Anti-Armor Gunnery System (STAGS).
AD-A107 481/4 1251

ARMY RESEARCH INST. FOR THE BEHAVIORAL AND SOCIAL SCIENCES, ALEXANDRIA, VA.

ARI-RR-1268
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AD-A107 296/6 1103

ARI-TR-480
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AD-A107 295/8 1111

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USARIEM-M-2/82
Isometric, Isotonic, and Isokinetic Torque Variations in Four Muscle Groups through a Range of Joint Motion,
AD-A107 324/6 1142

USARIEM-M-9/79
The Health Opinion Survey: Predicting Illness in Military Trainees.
AD-A106 853/5 1122

USARIEM-M-29/80
Prediction of Energy Expenditure during Load Carriage at High Altitude.
AD-A106 852/7 1143

USARIEM-M-32/80
Effect of Low Potassium Diet on Rat Exercise Hyperthermia and Heatstroke Mortality.
AD-A107 006/9 1144

USARIEM-T-2/81
Effectiveness of Five Water-Cooled Undergarments in Reducing Heat Stress of Vehicle Crewmen Operating in a Hot Wet or Hot Dry Environment.
AD-A107 105/9 1143

Heat Balance and Transfer in Men and Women Exercising in Hot-Dry and Hot-Wet Conditions.
AD-A107 004/4 1144

ARMY RUSSIAN INST., APO NEW YORK 09053.

2291
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AD-A107 075/4 1231

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PB82-121799 1091

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(FSWEC-80/0114)
PB82-121914 1109

EEO Statistics. Computer Operation Manual.
(FSWEC-80/0114-1)
PB82-121922 1109

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TOP-3-2-500
Weapon Characteristics.
AD-A107 310/5 1251

TOP-4-2-500
Ammunition Characteristics.
AD-A107 311/3 1250

TOP-5-2-619
Missile Safety Qualification of Short Range Air Defense (SHORAD) Missiles.
AD-A107 505/0 1232

ARNOLD ENGINEERING DEVELOPMENT CENTER, ARNOLD AFS, TN.

AEDC-TSR-80-P3
Wind Tunnel Test of a Self-Optimizing Flexible Technology Wing.
AD-A106 926/9 1077

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(HUD-0002076)
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Heterogeneity and Expression of the Zein Storage Protein Gene Family of Maize.
(CONF--8104110--1)
DE81030735 1120

BNL-29826
Review of Melting and Evaporation of Fusion-Reactor First Walls.
DE81030035 1239

BNL-30027
Heterogeneity and Expression of the Zein Storage Protein Gene Family of Maize.
(CONF--8104110--1)
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N82-11094/1 1222

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CONF-7804180-1
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AECL-6404 1157

PASS-6-1
Laser-Matter Interaction.
AECL-6343 1260

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RFP-Trans-297
Magnesium Hydroxide Neutron-Shielding Material and Method of Producing Such Material.
DE81030298 1242

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AD-A107 384/0 1237

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Maui Optical Tracking and Identification Facility Transition Program.
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N82-11511/4 1228

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AD-A107 247/9 1191

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PNL-3512
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PB82-129735 1141

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Present Situation of Filariasis in China,
PB82-129651 1131

Studies on the Rapid Detection of Dengue Virus Antigen by Immunofluorescence and Radioimmunoassay,
PB82-136052 1133

BERGER ASSOCIATES, INC., HARRISBURG, PA.

Coal Cooperative Efficiency Program: Small Mine Operations.
(ARC-77-203-5897)
PB82-109901 1166

BIONETICS CORP., HAMPTON, VA.

NASA-SP-5108
Handbook for Industrial Noise Control.
N82-11858/9 1252

BLACK AND VEATCH, KANSAS CITY, MO.

National Dam Safety Program. Burton-Duenke Dam Number 5 (MO 31608), Missouri - Osage - Gasconade Basin, Camden County, Missouri. Phase I Inspection Report.
AD-A107 486/3 1208

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AD-A107 487/1 1208

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AD-A107 542/3 1208

BOEING AEROSPACE CO., HOUSTON, TX.

NASA-CR-166228
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N82-11991/8 1209

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N82-11992/6 1209

BOEING AEROSPACE CO., SEATTLE, WA.

D180-2595-4-V-L-2
Study of Electrical and Chemical Propulsion Systems for Auxiliary Propulsion of Large Space Systems, Volume 2.
N82-11111/3 1271

D180-25956-3-V-1
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N82-11110/5 1271

D180-26426-2-V-2
Analysis of Space Systems Study for the Space Disposal of Nuclear Waste Study Report. Volume 2: Technical Report.
N82-11889/4 1245

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Analysis of Space Systems Study for the Space Disposal of Nuclear Waste Study Report. Volume 2: Technical Report.
N82-11889/4 1245

NASA-CR-165502-V-1
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N82-11110/5 1271

NASA-CR-165502-V-2
Study of Electrical and Chemical Propulsion Systems for Auxiliary Propulsion of Large Space Systems, Volume 2.
N82-11111/3 1271

BOEING CO., SEATTLE, WA.

D3-11158-1
Design and Fabrication of Coanda Suppressor Flow Visualization Model,
AD-A107 436/8 1270

BOEING COMMERCIAL AIRPLANE CO., SEATTLE, WA.

Aircraft Alerting Systems Standardization Study. Volume I. Candidate System Validation and Time-Critical Display Evaluation.
(FAA/RD-81/38/1)
AD-A107 225/5 1079

BOLT BERANEK AND NEWMAN, INC., CAMBRIDGE, MA.

BBN-4188
The Impact of Multiprocessor Technology on High-Level Language Design.
AD-A107 533/2 1173

BBN-4606
Railroad Yard Simulation Model: Description and Computer Program Users' Manual.
(FRA/ORD-81/25.I)
PB82-138686 1222

Model Noise Control Provisions for Building Codes and an Implementation Manual,
(EPA-550/9-81-401)
PB82-134081 1226

BOOZ-ALLEN AND HAMILTON, INC., BETHESDA, MD.

The Relationship between Adequacy of Test and Evaluation Data and DS ARC Decisions.
AD-A107 496/2 1090

BOSTON UNIV., MA.

The Impact of Regulation upon Job Design: A Preliminary Study.
(ASPER/PUR-81/0419/A)
PB82-133760 1110

Implications of Power Plant Coal Conversions on the Ports of New England: Volume I.
(MA-RD-940-82004)
PB82-136409 1231

Implications of Power Plant Coal Conversions on the Ports of New England. Volume II: Appendices,
(MA-RD-940-82004)
PB82-136417 1231

BRILL (WILLIAM) ASSOCIATES, INC., ANNAPOLIS, MD.

Crisis Intervention Training for Public Housing Residents and Staff: A Report on a Demonstration Program.
(HUD-0002131)
PB82-145004 1111

BROOKHAVEN NATIONAL LAB., UPTON, NY.

BNL-NUREG-51416
Radioactive Materials Released from Nuclear Power Plants.
NUREG/CR-2227 1246

BNL-29776
Simple Computer Program to Model 3-Dimensional Underground Heat Flow with Realistic Boundary Conditions.
DE81030213 1200

BNL-29948
Search for Promethium-Like Gold Lines and Other Transitions of Interest to Fusion Research.
DE81029917 1239

BNL-29963
Modeling Solar-Energy Systems for Economic Optimization.
DE81030030 1181

BNL-51373
Strategic Analysis of Conservation and Solar Energy Policies.
DE82000252 1181

BNL-51423
Development of Catalytic Systems for the Conversion of Syngas to Jet Fuel and Diesel Fuel and Higher Alcohols. Annual Report.
DE82000067 1151

BNL-51429
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CONF-810868-2
Search for Promethium-Like Gold Lines and Other Transitions of Interest to Fusion Research.
DE81029917 1239

CONF-811030-2
Modeling Solar-Energy Systems for Economic Optimization.
DE81030030 1181

CONF-811101-11
Simple Computer Program to Model 3-Dimensional Underground Heat Flow with Realistic Boundary Conditions.
DE81030213 1200

BROOKINGS INSTITUTION, WASHINGTON, DC.

FEDERAL AID CASE STUDIES SER PAPER-10
Case Studies of the Impact of Federal Aid on Major Cities: City of Cleveland.
(MEL-81-19)
PB82-131558 1114

BROWN UNIV., PROVIDENCE, RI. DEPT. OF CHEMISTRY.

TR-81-02
Vibrational Spectra of Oxygen- and Boron-Isotopically Substituted B2O3 Glasses.
AD-A107 333/7 1189

BROWN UNIV., PROVIDENCE, RI. DIV. OF ENGINEERING.

A Study of the Interactions between Large-Scale Coherent Structures and Fine-Grained Turbulence in a Round Jet.
AD-A106 993/9 1253

Interactions between Large-Scale Coherent Structures and Fine-Grained Turbulence in Free Shear Flows.
AD-A107 210/7 1253

Instability and Transition in Pipes and Channels.
AD-A107 211/5 1253

BROWN UNIV., PROVIDENCE, RI. LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS.

LCDS-81-18
Approximation of Processes and Applications to Control and Communication Theory,
AD-A107 520/9 1197

BUREAU OF LABOR STATISTICS, WASHINGTON, DC. OFFICE OF OCCUPATIONAL SAFETY AND HEALTH STATISTICS.

BLS/SDS/ID-79
Occupational Injuries and Illnesses, Idaho, 1979.
PB82-100041 1139

BLS/SDS/VI-79
Occupational Injuries and Illnesses, Virgin Islands, 1979.
PB82-100033 1139

BLS/SDS/WI-79
Occupational Injuries and Illnesses, Wisconsin, 1979.
PB82-100058 1139

BUREAU OF LAND MANAGEMENT, NEW ORLEANS, LA. NEW ORLEANS OUTER CONTINENTAL SHELF OFFICE.

BLM/YM/ES-81-004-1792
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PB82-109430 1210

BLM-YM-P/T-81-012-1792
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PB82-131301 1211

BUREAU OF MINES, ALBANY, OR. ALBANY RESEARCH CENTER.

BUMINES-RI-8573
Modification of a Commercial Atomic Absorption Spectrophotometer for Cold-Vapor Determination of Mercury.
PB82-135716 1229

BUREAU OF MINES, PITTSBURGH, PA. PITTSBURGH RESEARCH CENTER.

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BUMINES-RI-8591
Protection Factors of the Airstream Helmet.
PB82-135575 1143

BUMINES-TPR-114
The Water Spray Cooler - An Update.
PB82-135724 1167

BUREAU OF MINES, SPOKANE, WA. SPOKANE RESEARCH CENTER.

BUMINES-RI-8564
Factor of Safety Charts for Estimating the Stability of Saturated and Unsaturated Tailings Pond Embankments.
PB82-135518 1167

BUREAU OF MINES, TWIN CITIES, MN. TWIN CITIES RESEARCH CENTER.

BUMINES-RI-8569
Water Jet Perforation: A New Method of Completing and Simulating In situ Leaching Wells.
PB82-135563 1167

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BUMINES-IC-8826
Materials Recycling: An Overview of the Mineral Waste Utilization Symposium (6th).
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BUMINES-RI-8567
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(FSWEC-77/0109)
PB82-121815 1095

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PB82-121823 1095

DSMS Update System.
(FSWEC-77/0004)
PB82-121898 1095

DSMS Update System, User's Guide.
(FSWEC-77/0004-1)
PB82-121906 1095

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PB82-139387 1161

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(HUD-0002051)
PB82-144460 1116

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(HUD-0002087)
PB82-144718 1116

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Los Angeles - Long Beach, Calif. Standard Metropolitan Statistical Area.
(HUD-0002088)
PB82-144726 1116

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Madison, Wis. Standard Metropolitan Statistical Area.
(HUD-0002089)
PB82-144734 1116

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Newark, N.J. Standard Metropolitan Statistical Area.
(HUD-0002090)
PB82-144742 1117

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Orlando, Fla. Standard Metropolitan Statistical Area.
(HUD-0002091)
PB82-144759 1117

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Phoenix, Ariz. Standard Metropolitan Statistical Area.
(HUD-0002092)
PB82-144767 1117

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Saginaw, Mich. Standard Metropolitan Statistical Area.
(HUD-0002093)
PB82-144775 1117

Annual Housing Survey: 1977. Housing Characteristics for Selected Metrcpolitan Areas: Salt Lake City, Utah. Standard Metropolitan Statistical Area.
(HUD-0002094)
PB82-144783 1117

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Tacoma, Wash. Standard Metropolitan Statistical Area.
(HUD-0002095)
PB82-144791 1117

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Washington, D.C.-Md.-Va. Standard Metropolitan Statistical Area.
(HUD-0002096)
PB82-144809 1117

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CORPORATE AUTHOR INDEX

(HUD-0002097)
PB82-144817 1117

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Area: Anaheim, Santa Ana, Garden Grove, Calif. Standard Metropolitan Statistical Area.
(HUD-0002102)
PB82-144858 1118

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Dallas, Tex., Standard Metropolitan Statistical Area.
(HUD-0002103)
PB82-144866 1118

Annual Housing Survey: 1977. Housing Characteristics for Selected Metropolitan Areas: Fort Worth, Tex., Standard Metropolitan Statistical Area.
(HUD-0002104)
PB82-144874 1118

Annual Housing Survey: 1978. United States and Regions. Part A: General Housing Characteristics.
(HUD-0002105)
PB82-144882 1118

Annual Housing Survey: 1978. United States and Regions. Part C: Financial Characteristics of the Housing Inventory.
(HUD-0002106)
PB82-144890 1119

C-E MARINE POWER SYSTEMS, WINDSOR, CT.

Improved Atomization of Residual Fuels for Marine Boilers. Volume II: Cold Flow Baseline Performance Testing and Variation of Key Parameters - Cold Flow Improvement of Marine Boiler Atomizers,
(MA-RD-920-78074)
PB82-132614 1202

C-E POWER SYSTEMS, WINDSOR, CT.

EPRI-NP-1976
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DE81904251 1200

CACI, INC.-FEDERAL, ARLINGTON, VA.

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(CAA-D-81-2)
AD-A107 076/2 1232

CALCULON CORP., ROCKVILLE, MD.

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AD-A107 079/6 1094

CALGARY UNIV. (ALBERTA). DEPT. OF CHEMICAL AND PETROLEUM ENGINEERING.

Kinetics of Gas Hydrate Formation. Part I: Kinetics of Ethane Gas Hydrate Formation. Part II: Kinetics of Natural Gas Hydrate Formation.
(GRI-80/0100)
PB82-138868 1153

CALIFORNIA INST. OF TECH., PASADENA.

JPL-PUB-81-73
Modulation/Demodulation Techniques for Satellite Communications. Part 4: Appendices.
N82-11341/6 1234

NASA-CR-164943
Hotspots, Polar Wander, Mesozoic Convection and the Geoid.
N82-11694/8 1158

NASA-CR-164954
Modulation/Demodulation Techniques for Satellite Communications. Part 4: Appendices.
N82-11341/6 1234

The Von Karman Swirling Flows.
(ARO-15622.5-M)
AD-A107 010/1 1253

Two New Bifurcation Phenomena.
(ARO-15822.26-M)
AD-A107 011/9 1196

CALIFORNIA INST. OF TECH., PASADENA. SEISMOLOGICAL LAB.

CONTRIB-3337
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(AFOSR-TR-81-0720)
AD-A107 273/5 1168

CALIFORNIA UNIV., BERKELEY.

CONF-800919-3
Seismic Isolation of an Electron Microscope.
LBL-10386 1228

NASA-CR-164967
A Review and Interpretation of Recent Cosmic Ray Beryllium Isotope Measurements.
N82-12020/5 1083

An Exact Penalty Function Algorithm for Optimal Control Problems with Control and Terminal Equality Constraints. Part 1.
(ARO-11260.14-M)
AD-A107 275/0 1197

Saving Half of California's Energy and Peak Power in Buildings and Appliances Via Long-Range Standards and Other Legislation.
LBL-6865 1182

CALIFORNIA UNIV., BERKELEY. DEPT. OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCES.

Design Aids for VLSI: The Berkeley Perspective.
(ARO-17660.1-EL)
AD-A107 019/2 1178

CALIFORNIA UNIV., BERKELEY. EARTHQUAKE ENGINEERING RESEARCH CENTER.

UCB/EERC-81/14
TLUSH: A Computer Program for the Three-Dimensional Dynamic Analysis of Earth Dams,
(NSF/CEE-81044)
PB82-139940 1216

CALIFORNIA UNIV., BERKELEY. ELECTRONICS RESEARCH LAB.

UCB/ERL-M81/71
Quasineutral Hybrid Simulation of Macroscopic Plasma.
AD-A107 468/1 1260

UCB/ERL-M81/73
Kink Instabilities in Long Ion Layers.
AD-A107 466/5 1239

Plasma Theory and Simulation.
AD-A107 467/3 1260

CALIFORNIA UNIV., BERKELEY. INST. OF GOVERNMENTAL STUDIES.

Proposition 13 Research Inventory: A Partial Inventory of Research in the State of California and Elsewhere,
(HUD-0001984)
PB82-144429 1216

CALIFORNIA UNIV., BERKELEY. LAWRENCE BERKELEY LAB.

CONF-780883-
Post Hartree-Fock: Configuration Interaction.
LBL-8233 1151

CONF-790327-111
Stability of Intense Transported BEAMS.
LBL-8382 1257

CONF-790524-13
Spermatogonial Stem Cell Renewal Following Irradiation.
LBL-10109 1143

CONF-791233-2
Evaluation of Residential Building Energy-Performance Standards.
LBL-9816 1201

CONF-791233-6
New Measurement Strategy for in Situ Testing of Wall Thermal Performance.
LBL-8622 1226

CONF-800425-6
Potential Uses of Spent Shale in the Treatment of Oil Shale Retort Waters.
LBL-11072 1209

CONF-800507-7(Rev.)
Thermomechanical Modeling and Data Analysis for Heating Experiments at Stripa, Sweden.
LBL-10193(Rev.) 1245

CONF-800920-22
Analysis of Injection Testing of Geothermal Reservoirs.
LBL-10985 1166

CONF-801009-2
Efficient Access of Compressed Data.
LBL-10648 1095

CONF-801176-1
Thermodynamic Data for Flue-Gas Desulfurization Processes.
DE81030545 1150

CONF-7910166-6(Rev.)
Chemistry of Silica in Cerro Prieto Brines.
LBL-10166(Rev.) 1158

CONF-7910166-11
Intersecting Faults and Sandstone Stratigraphy at the Cerro Prieto Geothermal Field.
LBL-9546 1158

CONF-8106157-1
Relativistic Heavy-Ion Experiments.
DE81030544 1257

EEB-ENV-79-3
New Measurement Strategy for in Situ Testing of Wall Thermal Performance.
LBL-8822 1226

EEB-Vent-80-13
Operating Instructions for LBL Radon Measurement Facilities.
LBL-11097 1241

EEB-79-5
Energy Efficient Buildings Program. Chapter from Energy and Environment Division Annual Report 1978.
LBL-9576 1201

LBL-11758
Thermodynamic Data for Flue-Gas Desulfurization Processes.
DE81030545 1150

LBL-13029
Relativistic Heavy-Ion Experiments.
DE81030544 1257

LBL-13227
Diffusion of Gases in Capillaries.
DE82000267 1253

LBL-13238
Coal Liquefaction Research, October 1, 1978-September 30, 1981.
DE81030379 1267

LBL-13258
Laser-Induced-Fluorescence Studies of Fragment Ions: CH Exp + and CD exp + .
DE82001010 1151

Partitioning of Major, Minor, and Trace Elements During Simulated in-Situ Oil Shale Retorting.
LBL-9062 1151

Beta-Gauge Methods Applied to Aerosol Samples.
LBL-9128 1241

Ocean Thermal Energy Conversion Preliminary Data Report for the February 1978 GOTEC-03 Cruise to the Gulf of Mexico, Mobile Site.
LBL-9438 1186

Combustion Research. Chapter from the Energy and Environment Division Annual Report 1978.
LBL-9809 1209

Utility Solar Finance: Economic and Institutional Analysis.
LBL-9959 1098

BKY Programming Systems Bulletin No. 1. Guidelines for Converting FTN4 Programs to FTN5 and the New FORTRAN-77 Standard. First Edition.
LBL-10189/1 1174

Weldability of Thermally Grain-Refined Fe-12Ni-0.25Ti for Cryogenic Structural Applications.
LBL-10259 1192

NRCC Software Catalog. Volume 1.
LBL-10811 1174

SHAFT79 User's Manual.
LBL-10861 1166

Nuclear Materials Research Progress Reports for 1979.
LBL-11030 1249

Erosion-Corrosion-Wear Program.
LBL-11109 1192

Annual Environmental Monitoring Report of the Lawrence Berkeley Laboratory, 1979.
LBL-11192 1246

Labor Market Projections Model: A User's Guide to the Population, Labor Force, and Unemployment Projections Model at Lawrence Berkeley Laboratory.
LBL-11349 1097

CALIFORNIA UNIV., IRVINE. DEPT. OF CHEMISTRY.

TR-1
Symmetry Extinction of LEED Beams for Naphthalene Adsorbed on Pt(III).
AD-A106 963/2 1148

TR-2
The Nature of the Phase Transition Observed for Monolayers of Azulene on Pt(III).
AD-A107 087/1 1148

TR-3
Chemisorption and Thermal Chemistry of Azulene and Naphthalene Adsorbed on Pt(III).
AD-A107 068/9 1148

CALIFORNIA UNIV., LOS ANGELES. DEPT. OF MATERIALS SCIENCE AND ENGINEERING.

TR-81-02
Magnetomechanical Acoustic Emission--A New Method for Non-Destructive Stress Measurement.
AD-A107 228/9 1228

CALIFORNIA UNIV., LOS ANGELES. DEPT. OF SYSTEM SCIENCE.

TR-18
Quadratic-Exponential Moment Error Bounds for Digital Communication Systems.
AD-A106 906/1 1233

TR-20
The Use of Output Moments to Predict Performance of Nonlinear Systems with Gaussian Inputs.
AD-A106 905/3 1178

UCLA-ENG-81-30
Quadratic-Exponential Moment Error Bounds for Digital Communication Systems.
AD-A106 906/1 1233

UCLA-ENG-81-32
The Use of Output Moments to Predict Performance of Nonlinear Systems with Gaussian Inputs.
AD-A106 905/3 1178

CALIFORNIA UNIV., LOS ANGELES. INST. OF GEOPHYSICS AND PLANETARY PHYSICS.

NASA-CR-166713
Magnetic Field Investigation for ISEE Mother and Daughter Spacecraft.
N82-11105/5 1228

CALSPAN ADVANCED TECHNOLOGY CENTER, BUFFALO, NY.

Aerosol Composition in the Marine and Coastal Boundary Layer.
AD-A107 308/9 1084

CALSPAN FIELD SERVICES, INC., ARNOLD AFS, TN. AEDC DIV.

Wind Tunnel Tests of Elevon Gap Heating on the Space Shuttle Orbiter (OH-107).
(AEDC-TSR-81-V7)
AD-A107 287/5 1272

CAMBRIDGE UNIV. (ENGLAND). DEPT. OF ENGINEERING.

CUED/D-SOILS/TR-114-1981
A Review of Numerical Methods for the Analysis and Design of Soft Ground Tunnels,
PB82-134628 1213

CUED/D-SOILS/TR-115-1981
HOMEP - An Algorithm for Analysing Homogeneous Stress/Strain Histories,
PB82-134644 1170

CUED/F-CAMS/TR-216-1981
Optimization of Stochastic Relay Control Systems by Means of Dimensional Analysis,
PB82-134610 1198

CAMBRIDGE UNIV. (ENGLAND). DEPT. OF METALLURGY AND MATERIALS SCIENCE.

Microhardness, Friction and Wear of SiC and Si3N4 Materials as a Function of Load, Temperature and Environment.
AD-A107 501/9 1189

CARNEGIE-MELLON UNIV., PITTSBURGH, PA. DEPT. OF MECHANICAL ENGINEERING.

Boiling Heat Transfer in Confined Space.
AD-A107 363/4 1200

CARNEGIE-MELLON UNIV., PITTSBURGH, PA. ROBOTICS INST.

CMU-RI-TR-81-6
Sonar Image Processing. An Application of Template Matching through Relaxation.
AD-A107 281/8 1233

CARSON HELICOPTERS, INC., PARKASIE, PA.

Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Ohio, Pennsylvania and West Virginia: Canton Quadrangle. Final Report.
GJBX-92(80)(V.2A) 1165

CEA CENTRE D'ETUDES DE BRUYERES-LE-CHATEL, MONTROUGE (FRANCE).

CONF-780926-26
Evaluation of the Capture Cross Section of exp 169 Tm from 10 exp -5 EV to 2.10 exp 7 EV.
CEA-CONF-4469 1257

CEA CENTRE D'ETUDES NUCLEAIRES DE CADARACHE, SAINT-PAUL-LES-DURANCE (FRANCE). DEPT. DES REACTEURS A EAU.

CONF-7811105-2
SPH Homogeneization Method.
CEA-CONF-4492 1249

CEDARS-SINAI MEDICAL CENTER, LOS ANGELES, CA.

Rape Response: A Research Demonstration Project,
(NIMH-81-49)
PB82-134511 1132

CENTRAL INTELLIGENCE AGENCY, WASHINGTON, DC.

CR-81-11359
Directory of Soviet Officials: Republic Organizations.
PB81-928110 1095

CENTRE TECHNIQUE DES INDUSTRIES MECANIQUES, SENLIS (FRANCE).

CETIM-15-J-041-PT-2
Monitoring of Machines--Translation.
PB82-140211 1224

CER CORP., LAS VEGAS, NV.

DOE/BC/10003-23
Western Gas Sands Project. Interim Economic Analysis of Natural Gas Production from Tight Formations in Selected Western Basins.
DE82000709 1162

CH2M HILL, GAINESVILLE, FL.

Installation Restoration Program Records Search for Langley Air Force Base, Virginia.
AD-A106 864/2 1203

CHARLES RIVER ASSOCIATES, INC., BOSTON, MA.

CRA-446.01
Potential Fuel Conservation from Regulatory Reform of the Trucking Industry.
(DOT-P-50-81-92)
PB82-130907 1183

CHEM SYSTEMS, INC., NEW YORK.

Comparative Cost Estimates of Five Coal Utilization Processes.
ORNL/Sub-7384/1 1209

CHINESE ACADEMY OF MEDICAL SCIENCES, BEIJING. CAPITAL HOSPITAL.

A New Method for Determination of Anti-Double Strand DNA Antibodies, Trypanosoma Equiperdium Immunofluorescent Method,
PB82-129636 1131

Clinical Analysis of 120 Cases of Primary Amenorrhea,
PB82-136037 1133

A New Concept on Chiasmal Architecture and Its Projection on the Retina,
PB82-136060 1133

CHINESE MEDICAL ASSOCIATION, BEIJING.

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PB82-136029 1132

CHONGQING MEDICAL COLL. (CHINA). SECOND HOSPITAL.

Orthoplasty for Bile Duct Stricture at the Liver Hilum, A Preliminary Report of 5 Cases,
PB82-129727 1131

CINCINNATI UNIV., OH.

Report of an Amphipod Species New to Ohio: 'Gammarus minus' Say (Amphipoda: Gammaridae).
(EPA-600/J-77-183)
PB82-132457 1121

CINCINNATI UNIV., OH. DEPT. OF MECHANICAL AND INDUSTRIAL ENGINEERING.

UC-MIE-1015181-1C-ONR
User's Manual for UCIN-CABLE: Underwater Cables.
AD-A107 236/2 1224

CLARKSON COLL. OF TECHNOLOGY, POTSDAM, NY.

DOE/ET/13383-T1
Final Report on Grant No. DE-FG21-78ET13383.
DE81029479 1264

Proton Upsets in LSI Memories in Space.
(AFGL-TR-81-0315)
AD-A107 331/1 1173

COALITION OF NORTHEAST MUNICIPALITIES, BOSTON, MA.

Can Community Economic Development Meet the Fiscal Needs of Municipalities. Economic Growth and Fiscal Stress in Three Northeast Cities,
(HUD-0002060)
PB82-144510 1101

Forecasting Municipal Revenues and Expenditures: A Primer and Handbook,
(HUD-0002061)
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(HUD-0002062)
PB82-144536 1093

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(HUD-0002063)
PB82-144544 1216

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PB82-144551 1217

Municipal Energy Initiatives in the Northeast,
(HUD-0002065)
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AD-A107 294/1 1205

CRREL-SR-81-22
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AD-A107 293/3 1205

CRREL-81-14
Wastewater Treatment by a Prototype Slow Rate Land Treatment System,
AD-A106 975/6 1080

CRREL-81-15
A Statistical Evaluation of Soil and Climatic Parameters Affecting the Change in Pavement Deflection during Thawing of Subgrades,
AD-A106 976/4 1204

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AD-A107 131/5 1226

COLLEGE DE FRANCE, PARIS. LAB. DE PHYSIQUE CORPUSCULAIRE.

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LPC-79-03 1260

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N82-11037/0 1076

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N82-11036/8 1254

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COLORADO STATE UNIV., FORT COLLINS.

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(AID-PN-AAH-435)
PB82-133786 1137

LEC-3
Evaluation of Low-Cost Extrusion Cooker in Sri Lanka.
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PB82-133786 1137

COLORADO STATE UNIV., FORT COLLINS. DEPT. OF CHEMISTRY.

Chemistry of Aryloxazolines. Applications to the Synthesis of Lignan Lactone Derivatives.
(ARO-16965.4-C)
AD-A107 224/8 1147

COLORADO STATE UNIV., FORT COLLINS. DEPT. OF ELECTRICAL ENGINEERING.

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AD-A106 911/1 1262

COLORADO UNIV. AT BOULDER.

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AD-A107 362/6 1112

CORPORATE AUTHOR INDEX

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CRJP-236
Integration of Theory and Research in Judgment and Decision Making.
AD-A107 385/7 1112

COLORADO UNIV. AT BOULDER. DEPT. OF CHEMICAL ENGINEERING.

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PB82-140583 1154

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ICS-TR-107-ONR
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AD-A107 502/7 1112

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(NSF/RA-800605)
PB82-132663 1114

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CONF-810944-5
Rf Field Effects on the Cyclotron Arc Source.
DE81030972 1257

DOE/ER/40014-5
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DE81030972 1257

COLUMBIA UNIV., NEW YORK.

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AD-A107 218/0 1256

An Integrated Approach to the Optimization of High-Speed Cam-Follower Systems.
(ARO-12953.7-E, ARO-15911.2-E)
AD-A107 387/3 1224

COMBS (EARL R.), INC., MERCER ISLAND, WA.

TR-60
Alaska OCS Socioeconomic Studies Program: St. George Basin and North Aleutian Shelf Commercial Fishing Industry Analysis.
(BLM/YK-TR-81/01)
PB82-139817 1122

TR-61
Alaska OCS Socioeconomic Studies Program: St. George Basin Petroleum Development Scenarios, Anchorage Impact Analysis.
(BLM/YK-TR-81/02)
PB82-139825 1216

COMBUSTION ENGINEERING, INC., WINDSOR, CT.

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PB82-140104 1167

EUR-6864-EN
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PB82-139031 1202

EUR-6886-EN
Analysis of Complete Logical Structures in System Reliability Assessment,
PB82-138363 1242

EUR-6965-DE
Hybrid Processes for the Production of Hydrogen (Hybridprozesse zur Wasserstofferzeugung).
PB82-139452 1269

EUR-6991-EN
Determination of Skimmed-Milk Powder in Feedingstuffs: Study of Some Interferences,
PB82-137852 1137

EUR-7006-DE
Heat Recovery Installations with Reflux Heat Pipes as Basic Components (Waermerueckgewinnungsanlagen mit Reflux-Waermerohren als Bauelemente).
PB82-140146 1202

EUR-7031-EN
RSM Development for Nuclear Safety Analysis. A Test Problem,
PB82-138389 1242

EUR-7062-EN
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PB82-140138 1167

EUR-7063-EN
Development of a Directly-Fired Heat Pump for Domestic and Light Commercial Application.
PB82-137191 1202

EUR-7151-EN
The Dutch Geologic Radioactive Waste Disposal Project.
PB82-138397 1245

EUR-7165-FR
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PB82-139460 1269

EUR-7175-EN
The Certification of Polycyclic Aromatic Hydrocarbon Materials (PAH). Part II: The Six Methylchrysene Isomers (BRC Reference Materials No. 77, 78, 79, 80, 81 and 82),
PB82-138355 1153

EUR-7266-EN
Thermal Energy Storage Systems. Part I.
PB82-137589 1188

Improvements to Asbestos Diaphragms and Prospects for Their Replacement (Verbesserung von Asbest-Diaphragmen und deren eventueller Ersatz).
PB82-139445 1154

COMMUNICATIONS RESEARCH CENTRE, OTTAWA (ONTARIO).

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N82-11337/4 1234

COMPUTER CORP. OF AMERICA, CAMBRIDGE, MA.

CCA-80-17
Evaluation Criteria for a CODASYL Query Language.
(NBS-GCR-81-337)
PB82-136748 1176

CCA-80-18
Capabilities for a CODASYL Query Language.
(NBS-GCR-81-338)
PB82-136755 1176

CCA-80-19
A Survey of CODASYL Query Languages.
(NBS-GCR-81-339)
PB82-136763 1176

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An Analysis of Research Publications Supported by NIH (National Institutes of Health) 1970-1976: NIH and NCI (National Cancer Institute).
(NIH-73-2)
PB82-108614 1130

COMPUTER SCIENCES CORP., EL SEGUNDO, CA.

CSC/TM-80/6214
Magnetic Field Satellite (MAGSAT) Data Processing System Specifications.
N82-11103/0 1174

NASA-CR-166737
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N82-11103/0 1174

CONNECTICUT UNIV. HEALTH CENTER, FARMINGTON.

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(ARO-17029.1-L)
AD-A107 012/7 1141

CONSIGLIO NAZIONALE DELLE RICHERCHE, ROME (ITALY). GRUPPO DI RICERCA SULLE MACCHINE ELETTRICHE.

Symposium on Power and Measurement Transformers.
CONF-7909201- 1171

CONSORTIUM FOR PUBLIC ADMINISTRATION FIELD SERVICES, PITTSBURGH, PA.

Consortium for Public Administration Field Services: The First Two Years.
(HUD-0002086)
PB82-144700 1093

CONSTRUCTION ENGINEERING RESEARCH LAB. (ARMY), CHAMPAIGN, IL.

CERL-TR-M-292
EMP/EMI Hardening of Electrical Conduit Systems.
AD-A107 133/1 1171

CERL-TR-N-108
Overview of Considerations in Assessing the Biomass Potential of Army Installations.
AD-A107 132/3 1266

CORNELL UNIV., ITHACA, NY.

DOE/ER/03158-98
Point-Defect Sources and Sinks.
DE82000655 1252

Burning Rate Maximum of a Plane Premixed Flame.
(ARO-15882.30-M)
AD-A107 163/8 1264

CORPS OF ENGINEERS, DETROIT, MI. DETROIT DISTRICT.

Mitigation of Shore Damage Attributed to the Federal Navigation Structures at Ludington Harbor, Michigan.
AD-A106 932/7 1203

Mitigation of Shore Damage Attributed to the Federal Navigation Structures at Port Sanilac Harbor, Michigan.
AD-A106 933/5 1204

Maintenance Dredging & Confined Disposal Facility for the Crooked River Portion of Michigan's Inland Route and the Operation, Maintenance, & Proposed Public Use Facilities for the Alanson Lock and Weir, Michigan.
AD-A106 934/3 1204

Maintenance Dredging of the Federal Navigation Channels in the St. Clair River, Michigan.
AD-A106 935/0 1204

Maintenance Dredging of the Federal Navigation Channels in the Saginaw River and Saginaw Bay, Michigan.
AD-A106 936/8 1204

Final Environmental Statement. Sebewaing River, Michigan. Operation and Maintenance, Confined Disposal Facility, and Flood Control Facilities.
AD-A106 971/5 1204

Final Environmental Impact Statement on Modifications to Monroe Harbor, Michigan.
AD-A106 979/8 1204

Recreational Boat Harbor, Cedar River, Michigan. Revisions to General Design Memorandum Number 1 and Environmental Impact Statement. Supplement Number 1.
AD-A107 091/1 1205

Confined Disposal Facility and Maintenance Dredging of the Les Cheneaux Island Federal Navigation Channels, Michigan.
AD-A107 092/9 1205

Maintenance Operations of the Federal Navigation Channels and Structures at Bolles Harbor, Michigan.
AD-A107 368/3 1206

Confined Disposal Facility at Pointe Mouillee for Detroit and Rouge Rivers.
AD-A107 369/1 1206

Maintenance Dredging of the Federal Navigation Channels in the Detroit River, Michigan.
AD-A107 370/9 1206

CORPS OF ENGINEERS, ST. PAUL, MN. ST. PAUL DISTRICT.

Ontonagon Harbor Operation and Maintenance Activities. Lake Superior.
AD-A107 090/3 1204

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AD-A107 148/9 1205

COUNCIL ON LIBRARY RESOURCES, INC., WASHINGTON, DC.

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PB82-134529 1096

CREARE, INC., HANOVER, NH.

CREARE-TN-333
1/5-Scale Countercurrent Flow Data Presentation and Discussion.
NUREG/CR-2106 1248

DAMES AND MOORE, CRANFORD, NJ.

Noise Control: Pile Driver Demonstration Project, Waterloo, Iowa.
(CERL-TR-N-111)
AD-A107 239/6 1205

DAVID W. TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER, ANNAPOLIS, MD. PROPULSION AND AUXILIARY SYSTEMS DEPT.

DTNSRDC/PAS-81/14
Active Superconductive Generator Development 400-Horsepower Generator Design.
AD-A107 513/4 1185

DAVID W. TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER, ANNAPOLIS, MD. SHIP MATERIALS ENGINEERING DEPT.

DTNSRDC/SME-81/57
Dynamic J sub I-R Curve Testing of HY-130 Steel.
AD-A107 040/8 1191

DAVID W. TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER, BETHESDA, MD.

DTNSRDC-81/073
The Dynamic Design-Analysis Method (DDAM) in NASTRAN.
AD-A107 074/7 1262

DAYTON UNIV., OH. RESEARCH INST.

UDR-TR-80-119
Minimum Weight Design of Flat Sandwich Panels under Edgewise Compression Loads.
(AFWAL-TR-81-3009)
AD-A107 096/0 1226

UDR-TR-80-134
Finite Element Techniques for Static Stress and Free Vibration Analysis of Sandwich Composites.
(AFWAL-TR-81-3007)
AD-A107 095/2 1226

DAYTOP VILLAGE, INC., NEW YORK.

Advancement in Drug Free Therapeutic Community Treatment.
PB82-132795 1114

DEFENCE RESEARCH ESTABLISHMENT VALCARTIER (QUEBEC).

DREV-R-4198/81
Image Segmentation with Color and Texture,
AD-A107 479/8 1173

DREV-R-4201/81
A 10.6 micrometer Amplitude Modulated Telemeter Laser with Nonlinear Postdetection: Study of a Single Laser System--Translation.
AD-A107 475/6 1256

DEFENSE COMMUNICATIONS ENGINEERING CENTER, RESTON, VA.

DCEC-TR-10-80
Application of Digital Troposcatter to the DCS.
AD-A107 303/0 1234

DEFENSE INTELLIGENCE AGENCY, WASHINGTON, DC. DIRECTORATE FOR SCIENTIFIC AND TECHNICAL INTELLIGENCE.

DIA-DST-1740Z-001-77
Bibliography of Soviet Laser Developments, Number 26, October - December 1976.
AD-A107 305/5 1255

DIA-DST-1740Z-001-78
Bibliography of Soviet Laser Developments, Number 27, January - February 1977.
AD-A107 304/8 1255

DIA-DST-1740Z-002-78
Bibliography of Soviet Laser Developments, Number 28, March - April 1977.
AD-A107 306/3 1255

DIA-DST-1810S-144-81
Nutrition Research--USSR,
AD-A107 335/2 1137

DEFENSE MAPPING AGENCY HYDROGRAPHIC/ TOPOGRAPHIC CENTER, WASHINGTON, DC.

The Worldwide Navigational Warning Service,
AD-A107 372/5 1234

DEFENSE MAPPING AGENCY, WASHINGTON, DC.

Inertial Surveying Technology.
AD-A107 379/0 1157

DELPHI RESEARCH ASSOCIATES, WASHINGTON, DC.

Proceedings of the U.S.-U.S.S.R. Joint Seminar on Building Electrical, Plumbing, and Heating/Ventilating/Air Conditioning Systems.
(HUD-0002035)
PB82-144437 1227

DENVER RESEARCH INST., CO.

Tethered Balloon Sampling Systems for Monitoring Air Pollution.
(EPA-600/J-81-383)
PB82-126319 1210

DEPARTMENT OF AGRICULTURE, WASHINGTON, DC.

PB82-135567
Energy Efficient Lumber Dry Kiln Using Collectors and Refrigeration System.
PAT-APPL-6-276 764 1196

DEPARTMENT OF COMMERCE, WASHINGTON, DC.

Business America - The Magazine of International Trade, Volume 4, Number 24, November 30, 1981.
PB82-134321 1099

Business America - The Magazine of International Trade, Volume 4, Number 25, December 14, 1981.
PB82-137498 1100

DEPARTMENT OF ENERGY, ARGONNE, IL. NEW BRUNSWICK LAB.

Dissolution of HTGR TRISO Beads by the Alkali Fluoride Fusion Method.
NBL-296 1249

DEPARTMENT OF ENERGY, MORGANTOWN, WV. MORGANTOWN ENERGY TECHNOLOGY CENTER.

DOE/METC/SP-184
Fixed-Bed Gasification.
DE82000432 1146

Procedures for Petrophysical, Mineralogical and Geochemical Characterization of Fine-Grained Clastic Rocks and Sediments.
METC/CR-79/26 1158

Proceedings of the Second Annual Methane Recovery from Coal Beds Symposium.
METC/SP-79/9 1166

DEPARTMENT OF ENERGY, WASHINGTON, DC.

PAT-APPL-6-009 623
Perfluorocarbon Vapor Tagging of Blasting Cap Detonators.
PATENT-4 256 038 1250

PAT-APPL-6-137 095
Directional gamma Detector.
PATENT-4 259 575 1241

PAT-APPL-864 696
Toroidal Magnet System.
PATENT-4 263 096 1171

PAT-APPL-886 370
Mirror Plasma Apparatus.
PATENT-4 260 455 1240

Symposium on Commercial Aviation Energy Conservation Strategies, April 2-3, 1981. Papers and Presentations.
AD-A107 106/7 1181

DEPARTMENT OF ENERGY, WASHINGTON, DC. ASSISTANT SECRETARY FOR MANAGEMENT AND ADMINISTRATION.

DOE/MA-0035
Federal Employee Occupational Safety and Health Briefing for Management Officials.
DE82000706 1138

DEPARTMENT OF ENERGY, WASHINGTON, DC. DIV. OF ENVIRONMENTAL CONTROL TECHNOLOGY.

CONF-781109-(V.2)
Proceedings of the US Department of Energy Environmental Control Symposium. Volume 2. Nuclear Energy and Transportation.
DOE/EV-0046(V.2) 1244

DEPARTMENT OF ENERGY, WASHINGTON, DC. ECONOMIC REGULATORY ADMINISTRATION.

Environmental Assessment: Allocation of Petroleum Feedstock, Columbia LNG Corporation, Green Springs SNG Plant, Green Springs, Seneca County, Ohio.
DOE/EA-0061 1209

DEPARTMENT OF ENERGY, WASHINGTON, DC. ENERGY INFORMATION ADMINISTRATION.

National Electric Rate Book: Rhode Island.
DOE/EIA-0093 1097

DEPARTMENT OF ENERGY, WASHINGTON, DC. OFFICE OF NUCLEAR WASTE MANAGEMENT AND FUEL CYCLE PROGRAMS.

DOE/EIS-0082D
Draft Environmental Impact Statement: Defense Waste Processing Facility, Savannah River Plant, Aiken, SC.
DE81030992 1243

DEPARTMENT OF ENERGY, WASHINGTON, DC. OFFICE OF PROCUREMENT OPERATIONS.

DOE/MA-0025
Autopreps Data Base for Cost-Reimbursement Support Services or Nonnuclear R and D Procurements.
DE82000045 1090

DEPARTMENT OF HEALTH AND HUMAN SERVICES, WASHINGTON, DC.

PAT-APPL-931 098
Method for Continuous Ambulatory Peritoneal Dialysis.
PATENT-4 239 041 1140

PB82-137217
Method for Continuous Ambulatory Peritoneal Dialysis.
PATENT-4 239 041 1140

PB82-137522
Motorized Wheel Chair.
PAT-APPL-6-288 197 1140

PB82-137530
Four Input Coincidence Detector.
PAT-APPL-6-222 936 1241

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, WASHINGTON, DC.

Intermediate Minimum Property Standards for Solar Heating and Domestic Hot Water Systems. Volume 5.
(HUD-0002085)
PB82-144692 1184

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, WASHINGTON, DC. OFFICE OF ADP SYSTEMS DEVELOPMENT.

COBOL Structured Code Analyzer.
(FSWEC-80/0118)
PB82-121880 1175

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, WASHINGTON, DC. OFFICE OF INTERNATIONAL AFFAIRS.

HUD/IA-60
Productivity Trends in the Construction Industry: A Comparative International Review,
(HUD-0000958)
PB82-144320 1216

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, WASHINGTON, DC. OFFICE OF POLICY DEVELOPMENT AND RESEARCH.

HUD/PDR-416/2
Fiscal Year 1981 Research and Technology Program.
(HUD-0002101)
PB82-144841 1118

DEPARTMENT OF STATE, WASHINGTON, DC. OFFICE OF EXTERNAL RESEARCH.

Saudi Perceptions of the International Environment,
(FAR-211-GP)
AD-A106 927/7 1102

Saudi Arabia: The Flexibility of Islamic Fundamentalism,
(FAR-213-GP)
AD-A106 930/1 1102

Pakistan's Foreign Relations,
(FAR-212-GP)
AD-A107 113/3 1102

DEPARTMENT OF TRANSPORTATION, WASHINGTON, DC. OFFICE OF UNIV. RESEARCH.

DOT/RSPA/DPB-50/81/26
Department of Transportation Awards to Academic Institutions in Fiscal Year 1960,
PB82-141508 1216

DESMATICS, INC., STATE COLLEGE, PA.

TR-109-1
Statistical Research on Problems Associated with Navy Fire Protection and Fuel Technology Programs.
AD-A107 282/6 1225

DISTRICT OF COLUMBIA UNIV., WASHINGTON.

NASA-CR-164930
Computation of Averaged Monthly Zonal Albedo Utilizing the Solar Zenith Angle, Properties of Clear and Cloudy Atmospheres.
N82-12010/6 1082

DU PONT DE NEMOURS (E.I.) AND CO., AIKEN, SC. SAVANNAH RIVER LAB.

CONF-810956-1
Leaching of Nuclear-Waste Forms.
DE81030490 1243

DP-MS-81-44
Leaching of Nuclear-Waste Forms.
DE81030490 1243

DP-1582
Licensing Schedule for Away-from-Reactor (AFR) Spent Fuel Storage Facilities.
DE82000408 1244

DP-1598
In-Situ High-Resolution gamma-Spectrometric Survey of Burial Ground-Monitoring Wells.
DE81030827 1245

DPSTD-80-38
Preliminary Technical Data Summary for the Defense Waste Processing Facility, Stage 1.
DE82000035 1243

DU PONT DE NEMOURS (E.I.) AND CO., AIKEN, SC. SAVANNAH RIVER PLANT.

CONF-810404-2
High-Current Resistance Welding of Nuclear-Waste Containers.
DE81030403 1243

CONF-810508-3
Operating-Procedure System at Savannah River Plant.
DE81030405 1090

DPSPU-80-30-9
High-Current Resistance Welding of Nuclear-Waste Containers.
DE81030403 1243

DPSPU-80-30-13
Operating-Procedure System at Savannah River Plant.
DE81030405 1090

DUNLAP AND ASSOCIATES, INC., LA JOLLA, CA. WESTERN DIV.

Conceptual Development of a Preliminary LSO Carrier Landing Training Aid.
(NAVTRAEQUIPC-77-C-0166-2)
AD-A107 002/8 1107

Training Improvements for the Tactical Aircrew Training System (TACTS): Project Summary Report.
(NAVTRAEQUIPC-78-C-0136-3)
AD-A107 003/6 1107

Development of a Computer Based Air Combat Maneuvering Range Debrief System. Volume I.
(NAVTRAEQUIPC-78-C-0136-1)
AD-A107 342/8 1108

EASTMAN KODAK CO., ROCHESTER, NY. KODAK APPARATUS DIV.

Ultra-Lightweight Mirror Manufacturing and Radiation Response Study.
(RADC-TR-81-226)
AD-A106 996/8 1222

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(USCG-D-51-81)
AD-A107 045/7 1236

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AD-A106 941/8 1236

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Simulator Evaluation of Electronic Radio Aids to Navigation Displays--The Miniexperiment.
(USCG-D-59-80)
AD-A107 072/1 1236

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A Preliminary Examination of EDA Feasibility Studies.
PB82-126533 1091

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AGES-811110
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AGES-811113
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PB82-135211 1099

CORPORATE AUTHOR INDEX

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GJBX-71(80)(V.2)(OGDEN) 1164

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DE82900104 1248

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NP-1902598 1201

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AD-A107 358/4 1205

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EPA-600/4-80-025
Performance Tests for the Evaluation of Computerized Gas Chromatography/Mass Spectrometry Equipment and Laboratories,
PB82-137662 1229

ENVIRONMENTAL PROTECTION AGENCY, ANN ARBOR, MI. CONTROL TECHNOLOGY ASSESSMENT AND CHARACTERIZATION BRANCH.

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Nitrosamines and Other Hazardous Emissions from Engine Crankcases.
PB82-127960 1210

EPA-AA-CTAB/PA/81-18
Current Status of EPA Office of Mobile Source Air Pollution Control Characterization Projects: Summary.
PB82-105909 1269

ENVIRONMENTAL PROTECTION AGENCY, ANN ARBOR, MI. TEST AND EVALUATION BRANCH.

EPA-AA-TEB-81-25
Directory of Information for Dynamometer Testing of 1979-1981 Light Duty Motor Vehicles,
PB82-106873 1221

EPA-AA-TEB-81-27
Final Results of the 'One Week Follow-Up' with Participants during the FY79 and FY80 Emission Factor Testing Programs.
PB82-139494 1222

ENVIRONMENTAL PROTECTION AGENCY, ATLANTA, GA. REGION IV.

EPA-904/9-81-082
Tallahassee-Leon County Wastewater Management, Tallahassee, Leon County, Florida.
PB82-106428 1209

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PB82-107723 1210

EPA-450/2-81-003
Permit Fee Guideline.
PB82-107871 1210

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Questions and Responses at the 1981 Workshops on Procedures to Demonstrate Attainment of the NAAQS (National Ambient Air Quality Standards) for Ozone in the 1982 SIPs (State Implementation Plans).
PB82-107863 1210

ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, DC. OFFICE OF NOISE ABATEMENT AND CONTROL.

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EPA-540/RS-81-009
Pesticide Registration Standard: Isopropalin.
PB82-131293 1136

EPA-540/RS-81-014
Dialifor (O, O-diethyl S-(2-chloro-1-phthalimidoethyl) phosphorodithioate): Pesticide Registration Standard.
PB82-133638 1145

Naphthalene: Pesticide Registration Standard.
PB82-139437 1136

TEMEPHOS: O,O'-(thiodi-4,1-phenylene) bis(O,O-dimethyl phosphorothioate), Pesticide Registration Standard.
PB82-140641 1216

ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, DC. OFFICE OF WATER ENFORCEMENT.

NPDES Compliance Monitoring Inspector Training: Overview.
PB82-136342 1214

NPDES Compliance Monitoring Inspector Training: Legal Issues.
PB82-136359 1214

NPDES Compliance Monitoring Inspector Training: Biomonitoring.
PB82-136367 1214

NPDES Compliance Monitoring Inspector Training: Sampling Procedures.
PB82-136375 1214

NPDES Compliance Monitoring Inspector Training: Laboratory Analysis.
PB82-136383 1215

ENVIRONMENTAL RESEARCH AND DEVELOPMENT FOUNDATION, TUCSON, AZ.

Post Occupancy Evaluation of Housing.
(HUD-0000815)
PB82-144296 1115

ENVIRONMENTAL RESEARCH AND TECHNOLOGY, INC., CONCORD, MA.

ERT-P-7505-F
An Evaluation of the Spatial Resolution of Soil Moisture Information.
N82-11513/0 1170

ERT-TR-A345-T1
Variations in Atmospheric Angular Momentum.
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NASA-CR-166712
Variations in Atmospheric Angular Momentum.
N82-11690/6 1085

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An Evaluation of the Spatial Resolution of Soil Moisture Information.
N82-11513/0 1170

Study of Meteorological Conditions Along Actual or Proposed Reentry Trajectories.
(AFGL-TR-81-0184)
AD-A107 035/8 1273

ENVIRONMENTAL RESEARCH INST. OF MICHIGAN, ANN ARBOR.

E81-10190
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N81-29504/0 1080

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ENVIRONMENTAL RESEARCH LAB., ATHENS, GA.

EPA-600/J-80-044
Inductively Coupled Plasma-Atomic Emission Spectrometric Analysis of Environmental Samples Using Ultrasonic Nebulization.
PB82-118209 1229

ENVIRONMENTAL RESEARCH LAB.-DULUTH, MN.

EPA-600/J-81-347
Effects of Pollution on Freshwater Fish.
PB82-127358 1136

EPA-600/J-81-348
Effects of Acid Precipitation in North America.
PB82-128117 1136

ENVIRONMENTAL RESEARCH LAB., GULF BREEZE, FL.

EPA-600/4-81-076
Initial Toxicological Assessment of Ambush, Bolero, Bux, Dursban, Fentrifanil, Larvin, and Pydrin: Static Acute Toxicity Tests with Selected Estuarine Algae, Invertebrates, and Fish.
PB82-137654 1145

EPA-600/J-81-069
Marine and Estuarine Pollution.
PB82-128174 1136

EPA-600/J-81-128
Influence of Drilling Muds on the Primary Chemosensory Neurons in Walking Legs of the Lobster, 'Homarus americanus'.
PB82-128190 1136

ENVIRONMENTAL RESOURCES MANAGEMENT, INC., WEST CHESTER, PA.

Susquehanna River Anadromous Fish Studies, Conowingo Dam to Havre De Grace, Maryland.
(PPSP/UBLS-80-5)
PB82-135963 1121

Oxygen Dynamics Study - Susquehanna River Below Conowingo Dam, Maryland: Volume I.
(PPSP/UBLS-80-3)
PB82-135971 1136

ESCA-TECH CORP., COSTA MESA, CA.

Architectural and Historical Survey on Approximately 121,265 Acres in Central North Dakota.
PB82-109422 1104

EXOTECH PTY LTD., MONTEREY, CA.

Multistage Axial Compressor Program on Tip Clearance Effects.
(NPS-67-81-01CR)
AD-A107 445/9 1270

EXXON NUCLEAR IDAHO CO., INC., IDAHO FALLS.

Mockup Testing of Remote Systems for Zirconium Fuel Dissolution Process at the Idaho Chemical Processing Plant.
CONF-791103-70 1243

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AD-A107 396/4 1237

FAMILY HOSPITAL AND NURSING HOME, MILWAUKEE, WI.

Evaluation of a New Community Rape Treatment Center,
(NIMH-81-51)
PB82-133398 1132

FEDERAL AVIATION ADMINISTRATION TECHNICAL CENTER, ATLANTIC CITY, NJ.

FAA-CT-81-59
High-Speed Rotary Printing Device for Air Traffic Control Applications: A Preliminary Evaluation.
(FAA/RD-81/73)
AD-A107 325/3 1237

FAA-CT-81-61
Microwave Landing System Flare Subsystem Test.
AD-A107 327/9 1237

FAA-CT-81-205
First Annual Workshop on Aviation Related Electricity Hazards Associated with Atmospheric Phenomena and Aircraft Generated Inputs, February 26-27, 1980,
AD-A107 326/1 1077

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SIMPLEX 'A' - A Simplified Atmospheric Dispersion Model for Airport Use (Users Guide).
AD-A107 320/4 1205

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PB82-915200 1236

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FCTC-81-104
Harris Corporation, Harris 1600-02 Model II, Harris Interactive COBOL, Version 107.1 (Validation).
PB82-134412 1175

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FHWA/RD-80/069
Epoxy Thermoplastic Pavement Marking Material: Specification and Testing.
PB82-135914 1214

FENIX AND SCISSON, INC., TULSA, OK.

1-GWh Diurnal Load-Leveling Superconducting Magnetic Energy Storage System Reference Design. Appendix D: Superconductive Magnetic Energy Storage Cavern Construction Methods and Costs.
LA-7885-MS(V.5) 1188

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PB82-134222 1160

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User's Guide to the Physical Habitat Simulation System (PHABSIM).
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LAMAR INFORMATION LEAFLET-80-01
Electronically-Controlled Automatic Live-Food Feeder,
PB82-136656 1122

LAMAR INFORMATION LEAFLET-80-02
Handling and Transporting Juvenile American Shad,
PB82-136615 1121

LAMAR INFORMATION LEAFLET-80-03
Controlled Large-Scale Hatching of Brine Shrimp, 'Artemia salina',
PB82-136649 1121

LAMAR INFORMATION LEAFLET-80-04
Culturing, Harvesting, and Grading 'Daphnia',
PB82-136300 1121

LAMAR INFORMATION LEAFLET-80-05
Intensive Culture of Walleye ('Stizostedion vitreum vitreum'),
PB82-136391 1121

LAMAR INFORMATION LEAFLET-80-06
Decapsulation of Brine Shrimp ('Artemia salina') Cysts,
PB82-136631 1121

LAMAR INFORMATION LEAFLET-81-01
The Use of Self-Feeders in Fish Culture,
PB82-136425 1121

LAMAR INFORMATION LEAFLET-81-02
Degassing Supersaturated Water for Fish Culture,
PB82-136623 1121

FISH AND WILDLIFE SERVICE, WASHINGTON, DC. OFFICE OF BIOLOGICAL SERVICES.

FWS/OBS-81/13
Distribution and Abundance of Marine Birds and Mammals Wintering in the Kodiak Area of Alaska.
PB82-140187 1155

FLAHERTY-GIAVARA ASSOCIATES, NEW HAVEN, CT.

National Dam Safety Program. Norwich Water Works Dam Number 1 (Inventory Number NY 347), Susquehanna River Basin, Chenango County, New York. Phase I Inspection Report,
AD-A107 411/1 1207

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AD-A107 414/5 1207

FLORIDA GAME AND FRESH WATER FISH COMMISSION, VERO BEACH.

An Assessment of Wetland Habitat Establishment at a Central Florida Phosphate Mine Site.
(FWS/OBS-81/45)
PB82-130808 1211

FLORIDA STATE UNIV., TALLAHASSEE.

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Staphylococcus Aureus Protease: A Probe of Exposed, Non-Basic Histone Sequences in Nucleosomes.
DE81030486 1120

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Impact of Energy-Related Pollutants on Chromosome Structure. Progress Report, January 1, 1981-December 31, 1981.
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Informant Accuracy in Social Network Data V: An Experimental Attempt to Predict Actual Communication from Recall Data.
(BK-NSFIST-80-1)
PB82-131210 1112

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FLORIDA UNIV., GAINESVILLE. DEPT. OF ELECTRICAL ENGINEERING.

Conductivity Mobility, Hall Mobility, and Resistivity in p-Type Silicon.
(NBS-GCR-81-334)
PB82-135864 1263

FLORIDA UNIV., GAINESVILLE. DEPT. OF INDUSTRIAL AND SYSTEMS ENGINEERING.

A 'Uniformity Principle' for Evacuation Route Allocation,
PB82-140633 1199

FLOW RESEARCH CO., KENT, WA.

FRR-182
Calculations of Transonic Potential Flow over Cascades.
N82-11041/2 1270

NASA-CR-165471
Calculations of Transonic Potential Flow over Cascades.
N82-11041/2 1270

FOOD AND DRUG ADMINISTRATION, ROCKVILLE, MD. BUREAU OF DRUGS.

Approved Prescription Drug Products with Therapeutic Equivalence Evaluations.
(FDA/DF-81/004)
PB82-129164 1141

FDA Drug and Device Product Approvals.
PB82-923700 1142

FORD, BACON AND DAVIS UTAH, INC., SALT LAKE CITY.

DOE/UMT-0106
Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000817 1244

DOE/UMT-0106S
Summary of the Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000816 1244

FBDU-360-19
Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000817 1244

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Summary of the Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000816 1244

FORD MOTOR CO., DEARBORN, MI.

Brittle Materials Design, High Temperature Gas Turbine.
(AMMRC-TR-81-14)
AD-A107 522/5 1189

FOREIGN TECHNOLOGY DIV., WRIGHT-PATTERSON AFB, OH.

FTD-ID(RS)T-0709-81
Selected Articles--Translation.
AD-A107 322/0 1077

FTD-ID(RS)T-0721-81
China's Ballistic Missile Plans--Translation.
AD-A107 426/9 1232

FOREST POLICY PROJECT, VANCOUVER, WA.

Forest Policy Project Module III-A: Timber Supply Analysis and Baseline Simulations.
PB82-107509 1081

Forest Policy Project Module IV A: Socioeconomic Impact Assessment and Module IV B: Environmental Impact Assessment.
PB82-108085 1081

Alternative Forest Policies for the Pacific Northwest: Study Module V.
PB82-109125 1082

FOREST PRODUCTS LAB., MADISON, WI.

FPL-FSRN-0244
Analysis of Continuous Beams with Joint Slip.
AD-A107 112/5 1221

Fire Endurance Under Design Load for Walls of One-Story Three-Room Structures of Sandwich and Wood-Frame Construction,
(HUD-0002069)
PB82-144601 1227

FOSTER-MILLER ASSOCIATES, INC., WALTHAM, MA.

BM-7526
Development of a Man and Supply Hoisting System for Underground Metal and Nonmetal Mines. Volume II. Operation and Maintenance Manual.
PB82-132515 1166

DOT-7932
Improvement of Device (CMD) for Monitoring the Consolidation of Plastic Concrete.
(FHWA/RD-81/117)
PB82-132390 1219

FRANKLIN RESEARCH CENTER, PHILADELPHIA, PA.

Installation Guidelines for Solar Domestic Hot Water (DHW) Systems in One- and Two-Family Dwellings. Second Edition.
(HUD-0002079, HUD/PDR-407(2))
PB82-144676 1202

GCA CORP., BEDFORD, MA. GCA TECHNOLOGY DIV.

High Concentration Dust Monitor.
(BUMINES-OFR-159-81)
PB82-139320 1229

CORPORATE AUTHOR INDEX

GENERAL ACCOUNTING OFFICE, WASHINGTON, DC.
Food in the Future: Proceedings of a Planning Symposium.
AD-A107 145/5 1079

GENERAL ACCOUNTING OFFICE, WASHINGTON, DC. ACCOUNTING AND FINANCIAL MANAGEMENT DIV.
GAO/AFMD-81-66
Review of Department of Transportation's Response to Recommendations in the Senate Report on the Federal Aviation Administration's En Route Air Traffic Control Computer System.
AD-A106 850/1 1236

GAO/AFMD-81-71
Data on Small Business--Much is Collected but it Should be Integrated for Better Use.
AD-A106 851/9 1094

GAO/AFMD-81-77
Allegations that a Political Appointee at the Environmental Protection Agency was Exercising Control over the Office of the Inspector General.
AD-A107 190/1 1108

GAO/AFMD-81-86
Review of Circumstances of the Mass Removal of Statutory Inspectors General.
AD-A107 189/3 1108

GAO/AFMD-81-93
Terminating the Audit of the National Flood Insurance Program's Fiscal 1980 Financial Statements.
AD-A107 188/5 1089

GAO/AFMD-81-94
Examination of the Effectiveness of Statutory Offices of Inspector General.
AD-A107 187/7 1089

GENERAL ACCOUNTING OFFICE, WASHINGTON, DC. COMMUNITY AND ECONOMIC DEVELOPMENT DIV.
CED-81-151
SBA's Progress in Implementing the Public Law 95-507 Subcontracting and Surety Bond Waiver Provisions Has Been Limited.
PB82-133844 1092

CED-82-1
User Charge Revenues for Wastewater Treatment Plants--Insufficient to Cover Operation and Maintenance.
PB82-137761 1215

CED-82-4
Requests for Federal Disaster Assistance Need Better Evaluation.
PB82-139122 1115

GAO/CED-81-79
Transportation Contingency Plans for Future Gas Shortages will not Meet Commuter Needs.
AD-A106 826/1 1179

GAO/CED-81-88
Health and Safety Deficiencies Found at Water Recreation Areas.
AD-A106 827/9 1122

GAO/CED-81-108
HUD Should Strengthen Mortgagee Monitoring to Reduce Losses.
AD-A107 283/4 1097

GAO/CED-81-109
Corps of Engineers' Acquisition of Fish Hatchery Proves Costly.
AD-A106 828/7 1079

GAO/CED-81-119
Cooperative Extension Service's Mission and Federal Role Need Congressional Clarification.
AD-A107 482/2 1102

GAO/CED-81-121
Efforts to Improve School Lunch Programs--Are They Paying Off.
AD-A106 829/5 1137

GAO/CED-81-122
Still No Progress in Implementing Controls over Contracts and Grants with Indians.
AD-A106 830/3 1087

GAO/CED-81-127
Controller Staffing and Training at Four FAA Air Traffic Control Facilities.
AD-A106 831/1 1105

GAO/CED-81-128
Information on the U.S. Coast Guard's Decision to Purchase the M/V Cowslip Vessel.
AD-A107 374/1 1231

GAO/CED-81-130
Analysis of HUD's May 4, 1981 Response Concerning Its Efforts to Alleviate Housing Abandonment.
AD-A106 832/9 1203

GAO/CED-81-133
Consumers Need More Reliable Automobile Fuel Economy Data.
AD-A106 833/7 1179

GAO/CED-81-135
Federal Land Acquisition and Management Practices.
AD-A106 834/5 1203

GAO/CED-81-136
Legislative and Regulatory Actions Needed to Deal with a Changing Domestic Telecommunications Industry.
AD-A106 835/2 1102

GAO/CED-81-139
Review of the Navajo and Hopi Indian Relocation Commission's Program.
AD-A106 836/0 1113

GAO/CED-81-140
Conrail Needs to Further Improve Inventory Control and Management.
AD-A106 837/8 1088

GAO/CED-81-145
Comments on Interior's Surface Mining Regulations.
AD-A107 185/1 1161

GAO/CED-81-146
Eliminating Contractor Inspections of Federal Water Projects Could Save Millions.
AD-A106 838/6 1203

GAO/CED-81-147
Inquiry into the Status of a Proposal to Construct 16 Single-Family Detached Homes for the Cuyahoga Metropolitan Housing Authority in Cleveland, Ohio.
AD-A106 891/5 1113

GAO/CED-81-149
SBA's 7(j) Management Assistance Program: Changes Needed to Improve Efficiency and Effectiveness.
AD-A106 839/4 1088

GAO/CED-81-150
GAO Comments on the Impact of the USDA Reorganization of Nutrition.
AD-A106 940/0 1089

GAO/CED-81-151
SBA's Progress in Implementing the Public Law 95-507 Subcontracting and Surety Bond Waiver Provisions has been Limited.
AD-A106 840/2 1088

GAO/CED-81-152
Grain Fumigation: A Multifaceted Issue Needing Coordinated Attention.
AD-A106 841/0 1079

GAO/CED-81-156
Information on Peanut Allotment Owners that Lease and Rent Away Rather Than Plant Their Peanut Allotments/Quotas.
AD-A107 377/4 1079

GAO/CED-81-157
Storage Cost Data on CCC-Owned Dairy Commodities.
AD-A106 892/3 1137

GENERAL ACCOUNTING OFFICE, WASHINGTON, DC. ENERGY AND MINERALS DIV.
GAO/EMD-81-24
Status of Strategic Petroleum Reserve Activities--October 1980.
AD-A107 196/8 1266

GAO/EMD-81-88
FERC Should Improve the Natural Gas Well Determination Process.
AD-A106 859/2 1265

GAO/EMD-81-92
Questions Concerning DOE's Assignment of Operating and Testing Responsibilities for OTEC-1.
AD-A106 860/0 1179

GAO/EMD-81-93
Energy-Efficient and Cost-Effective Equipment Should be Installed in New Government Housing.
AD-A106 900/4 1199

GAO/EMD-81-96
Follow-up Report on Domestic Aluminum Resources: Dilemmas of Development.
AD-A106 901/2 1191

GAO/EMD-81-103
Energy Impacted Area Development Assistance Program's Designation Criteria.
AD-A106 902/0 1180

GAO/EMD-81-104
Minerals Critical to Developing Future Energy Technologies, Their Availability, and Projected Demand.
AD-A106 903/8 1180

GAO/EMD-81-105
Burdensome and Unnecessary Reporting Requirements of the Public Utility Regulatory Policies Act Need to be Changed.
AD-A106 904/6 1180

GAO/EMD-81-106
Greater Commitment Needed to Solve Continuing Problems at Three Mile Island.
AD-A106 915/2 1242

GAO/EMD-81-107
Status of Strategic Petroleum Reserve Activities.
AD-A107 373/3 1266

GAO/EMD-81-110
Elimination of Federal Funds for the Heber Project will Impede Full Development and Use of Hydrothermal Resources.
AD-A106 916/0 1180

GAO/EMD-81-111
Congress Should Increase Financial Protection to the Public from Accidents at DOE Nuclear Operations.
AD-A106 917/8 1242

GAO/EMD-81-112
Update of Cost Information Contained in a Previous GAO Report on Specific Aspects of the Clinch River Breeder Reactor Project.
AD-A106 918/6 1246

GAO/EMD-81-113
Ineffective Management of the Appropriate Technology Small Grants Program.
AD-A106 882/4 1088

GAO/EMD-81-115
Options for Establishing an Energy Conservation Consolidated Grant Program.
AD-A106 919/4 1180

GAO/EMD-81-116
Synthetic Fuels Corporation's Management of Demonstration Projects Would Be Limited.
AD-A106 920/2 1266

GAO/EMD-81-117-VOL-1
The United States Remains Unprepared for Oil Import Disruptions. Volume I. Summary: Includes Conclusions and Recommendations.
AD-A106 921/0 1180

GAO/EMD-81-117-VOL-2
The United States Remains Unprepared for Oil Import Disruptions. Volume II. Detailed Review of Current Emergency Programs and Alternative Approaches.
AD-A106 922/8 1180

GAO/EMD-81-118
Status of Strategic Petroleum Reserve Activities--July 1981.
AD-A106 923/6 1266

GAO/EMD-81-123
Federal Energy Regulatory Commission Needs to Act on the Construction-Work-in-Progress Issue.
AD-A106 924/4 1180

GAO/EMD-81-128
Unresolved Issues Resulting from Changes in DOE's Synthetic Fuels Commercialization Programs.
AD-A106 883/2 1266

GAO/EMD-81-129
The United States Synthetic Fuels Corporation's Project Selection Guidelines Need Clarification.
AD-A107 184/4 1266

GAO/EMD-81-131
The Debate over Acid Precipitation--Opposing Views--Status of Research.
AD-A106 925/1 1083

GAO/EMD-81-132
Coal and Nuclear Wastes--Both Potential Contributors to Environmental and Health Problems.
AD-A106 884/0 1135

GAO/EMD-81-134
Potential Impediment of Foundry Capacity Relative to National Defense Needs.
AD-A106 885/7 1097

GAO/EMD-81-135
Improvements in Department of the Interior Leasing of Potential Aluminum Resources Are Necessary for More Timely Decisionmaking.
AD-A106 886/5 1191

GAO/EMD-81-142
The Oil Shale Corporation Loan Guarantee Contract.
AD-A106 887/3 1180

GAO/EMD-81-145
Analysis of Federal Funding for Electric Utility R&D Projects.
AD-A106 888/1 1088

GENERAL ACCOUNTING OFFICE, WASHINGTON, DC. FEDERAL PERSONNEL AND COMPENSATION DIV.
FPCD-82-1
Civil Service Reform After Two Years: Some Initial Problems Resolved but Serious Concerns Remain.
PB82-134131 1110

GAO/FPCD-81-34
Recruiting Malpractice: Extent, Causes, and Potentials for Improvement.
AD-A106 844/4 1105

GAO/FPCD-81-56
Initial Skill Training for Navy Enlisted Personnel.
AD-A107 177/8 1107

GAO/FPCD-81-60
Alternatives to the Current Method of Computing General Schedule Pay.
AD-A107 178/6 1107

GAO/FPCD-81-62
Follow-Up on Actions to Improve Coordination and Utilization of Human Resources Research and Development.
AD-A107 179/4 1107

GAO/FPCD-81-69
Obstacles Hamper the Office of Personnel Management's Evaluation of the Implementation of the 1978 Civil Service Reform Act.
AD-A107 180/2 1107

GAO/FPCD-81-71
Tightening Eligibility Standards Could Cut Involuntary Retirement Costs by Millions of Dollars.
AD-A106 842/8 1105

GAO/FPCD-81-73
Serious Problems Need to be Corrected before Federal Merit Pay Goes into Effect.
AD-A106 843/6 1105

GAO/FPCD-81-74
Problems with the Small Business Administration's Merit Appraisal and Compensation System.
AD-A107 181/0 1107

GENERAL ACCOUNTING OFFICE, WASHINGTON, DC. GENERAL GOVERNMENT DIV.

GAO/GGD-81-93
The Comptroller of the Currency Should Decide the Extent to Which His Action Control System is Needed.
AD-A107 182/8 1097

GAO/GGD-81-102
Fewer Agent Transfers Should Benefit the FBI and Its Agents as Well as Save Money.
AD-A107 183/6 1107

GGD-82-2
Stronger Federal Effort Needed in Fight Against Organized Crime.
PB82-139148 1115

GENERAL ACCOUNTING OFFICE, WASHINGTON, DC. HUMAN RESOURCES DIV.

GAO/HRD-81-91
Social Security Administration Policies for Managing Its Administrative Law Judges.
AD-A107 191/9 1108

GAO/HRD-81-106
Veterans Administration's Efforts to Improve the Management of Paper Records in the Department of Veterans Benefits. A Major System Acquisition Project.
AD-A107 192/7 1095

GAO/HRD-81-107
Issues Related to the Longshoremen's and Harbor Workers' Compensation Act.
AD-A107 193/5 1108

GAO/HRD-81-112
Delays in Receiving and Investing Taxes are Reducing Railroad Retirement Program Interest Income.
AD-A106 861/8 1105

GAO/HRD-81-119
Concerns about HHS' Ability to Effectively Implement Incentive Funding for State Information Systems in the Aid to Families with Dependent Children Program.
AD-A106 871/7 1088

GAO/HRD-81-122
Ohio's 1981 Home Energy Assistance Program.
AD-A106 872/5 1180

GAO/HRD-81-123
Injury Compensation Process Delays Prompt Payment of Benefits to Federal Workers.
AD-A106 873/3 1088

GAO/HRD-81-127
Limits on Receipt of Multiple Disability Benefits Could Save Millions.
AD-A106 874/1 1106

GAO/HRD-81-128
Veterans Administration Education Loan Program Should be Terminated: Legislative Action Taken.
AD-A106 845/1 1105

GAO/HRD-81-131
The National Institute on Alcohol Abuse and Alcoholism Should Make Greater Efforts to Support Treatment Demonstration Projects.
AD-A107 194/3 1123

GAO/HRD-81-133
States' Efforts to Detect Duplicate Public Assistance Payments.
AD-A106 846/9 1113

GAO/HRD-81-136
Department of Labor Needs to Give CETA Prime Sponsors More Guidance and Assistance for Implementing Monitoring Requirements.
AD-A106 847/7 1105

GAO/HRD-81-139
The Guaranteed Student Loan Information System Needs a Thorough Redesign to Account for the Expenditure of Billions.
AD-A106 875/8 1088

GAO/HRD-81-140
Medicare's Reimbursement Policies for Durable Medical Equipment Should be Modified and Made More Consistent.
AD-A106 876/6 1122

GAO/HRD-81-146
Information on Funding Commitments from Comprehensive Employment and Training Act Titles III and IV during Fiscal Year 1981.
AD-A106 877/4 1106

GAO/HRD-81-148
The Veterans Administration's Efforts to Consolidate Computer Programming Resources at a Single Location.
AD-A107 197/6 1108

GAO/HRD-81-150
Improvements Needed in Assessing Penalties and Controlling Penalty Collections Resulting from Occupational Safety and Health Inspections.
AD-A106 848/5 1138

GAO/HRD-81-152
Allocation of an Air Force Contractor's Pension Fund Assets May be Inequitable.
AD-A107 375/8 1090

GAO/HRD-81-153
Follow-Up Review to Determine the Extent to Which the Department of Health and Human Services has Implemented the Recommendations in Our Report: 'Increased Federal Efforts Needed to Better Identify, Treat, and Prevent Child Abuse and Neglect'.
AD-A106 849/3 1113

GENERAL ACCOUNTING OFFICE, WASHINGTON, DC. INTERNATIONAL DIV.

GAO/ID-81-35
U.S. Laws and Regulations Applicable to Imports from Nonmarket Economies Could be Improved.
AD-A106 878/2 1097

GAO/ID-81-38
Unresolved Issues Remain Concerning U.S. Participation in the International Energy Agency.
AD-A106 879/0 1102

GAO/ID-81-39
Management of the Department of State Office of Passport Services Needs to be Improved.
AD-A106 880/8 1088

GAO/ID-81-62
U.S. Role in Sinai Important to Mideast Peace.
AD-A106 899/8 1102

GAO/ID-81-63
Industry Views on the Ability of the U.S. Photovoltaics Industry to Compete in Foreign Markets.
AD-A106 881/6 1097

GENERAL ACCOUNTING OFFICE, WASHINGTON, DC. MISSION ANALYSIS AND ACQUISITION DIV.

GAO/MASAD-81-27
Military Contractor-Operated Stores' Contracts are Unmanageable and Vulnerable to Abuse.
AD-A107 499/6 1231

GAO/MASAD-81-37
FAA's Communications Equipment Replacement Plans.
AD-A107 186/9 1233

GAO/MASAD-81-41
Questionable Use of the C-X and Other Air Force Weapon System Funds.
AD-A106 898/0 1231

GAO/MASAD-81-43
The British Sting Ray Torpedo: Information Should be Obtained to Determine Potential Benefits to U.S. Antisubmarine Warfare Programs.
AD-A106 896/4 1252

GAO/MASAD-81-44
Evaluation of the Army's Advanced Field Artillery Tactical Data System.
AD-A106 897/2 1251

GAO/MASAD-82-5
Budgetary Pressures Created by the Army's Plans to Procure New Major Weapon Systems are Just Beginning.
AD-A107 284/2 1089

GENERAL ACCOUNTING OFFICE, WASHINGTON, DC. PROCUREMENT, LOGISTICS, AND READINESS DIV.

GAO/PLRD-81-34
Logistics Concerns over Navy's Guided Missile Frigate FFG-Class.
AD-A107 500/1 1224

GAO/PLRD-81-54
The Navy Must Improve Its Accountability for Conventional Ammunition.
AD-A107 174/5 1230

GAO/PLRD-81-61
Review of Government-Wide Contracting Systems for Film and Videotape Productions.
AD-A107 175/2 1089

GAO/PLRD-81-63
Allegations of Unfair Bidding Requirements at Griffiss Air Force Base, Rome, New York.
AD-A106 893/1 1088

GAO/PLRD-81-64
Allegations of Unethical Bidding Practices on Federal Construction Contracts.
AD-A107 176/0 1089

GAO/PLRD-81-66
Inquiry Concerning Denial of Contracts to Low Offeror for Army Translation Services.
AD-A106 894/9 1088

GAO/PLRD-81-68
HUD's Oversight of Procurement by Public Housing Authorities Needs Strengthening.
AD-A106 895/6 1089

PLRD-82-9
DOD Can Increase Revenues Through Better Use of Natural Resources It Holds in Trust.
PB82-134040 1213

GENERAL ACCOUNTING OFFICE, WASHINGTON, DC. PROGRAM ANALYSIS DIV.

GAO/PAD-81-1
Billions of Dollars are Involved in Taxation of the Life Insurance Industry -- Some Corrections in the Law are Needed.
AD-A106 856/8 1097

GAO/PAD-81-68
Special Estate Tax Provisions for Farmers Should be Simplified to Achieve Fair Distribution of Benefits.
AD-A106 857/6 1102

GAO/PAD-81-87
Status Report on Implementation of GAO's Audit Findings and Recommendations.
AD-A107 376/6 1090

GAO/PAD-81-88
Progress in Improving Program and Budget Information for Congressional Use.
AD-A106 858/4 1088

PAD-82-12
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PB82-137753 1096

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DE81027453 1247

DOE/SF/71031-T25
FFTF MOTA: Design Thermal and Stress Overcheck Analyses.
DE81027367 1247

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AD-A107 315/4 1270

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(BUMINES-OFR-164-81)
PB82-137316 1229

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(AFHRL-TP-81-30)
AD-A107 277/6 1089

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PUB/P-80-1
The Federal Side of Traditional Telecommunications Cost Allocations,
PB82-128976 1234

PUB-P-80-4
Compunications Network Management,
PB82-129081 1235

PUB-P-80-7
The Traditional State Side of Telecommunications Cost Allocations,
PB82-129107 1235

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PB82-128992 1234

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AD-A107 025/9 1168

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AD-A107 027/5 1157

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AD-A107 028/3 1168

HIG-CONTRIB-1096
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(NSF/RA-780915)
PB82-132804 1178

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DE81025788 1257

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HRP-0903306/9 1124

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AD-A107 156/2 1149

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N82-11493/5 1273

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TR-5
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AD-A106 938/4 1148

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N82-11100/6 1272

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AD-A107 515/9 1103

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(ARI-RN-80-25)
AD-A107 529/0 1173

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AD-A107 253/7 1172

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AD-A107 165/3 1195

TR-6
Preparation and Characterization of Neutral and Oxidized Polypyrrole Films.
AD-A107 166/1 1195

TR-7
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AD-A107 167/9 1149

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TR-16
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AD-A106 854/3 1148

Time-Resolved Infrared Study of Bimolecular Reactions between Tert-Butly Radicals.
(ARO-17266.1-P)
AD-A107 154/7 1148

Spatial Separation of Carriers in InAs-GaSb Superlattices.
(ARO-15229.21-P)
AD-A107 155/4 1263

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(ARO-15229.24-P)
AD-A107 157/0 1252

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IDO-10085 1244

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N82-11207/9 1256

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DE82000060 1151

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DE82000061 1151

DOE/ER/01198-1364
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Phonons in Alkali Graphite Intercalation Compounds.
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DOE/ER/01198-1366
Lattice Dynamics of Graphite Intercalation Compounds: Modelled by the Phonon Dispersion of Linear Chains.
DE82000061 1151

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(ARO-16849.11-EL)
AD-A106 907/9 1262

Linearization of the Water Sorption Isotherm for Homogeneous Ingredients Over aw 0.30 - 0.95.
(ARO-15871.7-L)
AD-A107 160/4 1149

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T-111
Annual Progress Report.
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(ARO-16849.1-EL)
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TR-3
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GJBX-37(79)(V.1) 1163

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N82-11693/0 1085

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50
Advances in Sample Introduction for Elemental Analysis.
AD-A107 514/2 1150

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Software Technology Transfer and Export Control.
(IDA/HQ-81-23408, AD-E500-419)
AD-A106 869/1 1097

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INT-101/I 1151

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PB82-132713 1219

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N82-11550/2 1182

JPL-PUB-81-45
Assessment of Advanced Coal Gasification Processes.
N82-11146/9 1147

JPL-PUB-81-48
Nonparametric Identification of a Class of Nonlinear Close-Coupled Dynamic Systems.
N82-11098/2 1272

JPL-PUB-81-60
Low-Cost Solar Array Project: Four Absolute Cavity Radiometer (Pyrheliometer) Intercomparisons at New River, Arizona: Radiometer Standards.
N82-11435/6 1228

JPL-PUB-81-74
Geologic Considerations in Underground Coal Mining System Design.
N82-11516/3 1166

JPL-PUB-81-75
Evaluation of the Micro-Carburetor.
N82-11994/2 1271

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The Effects of Impurities on the Performance of Silicon Solar Cells.
N82-11548/6 1187

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Coal Desulfurization by Low Temperature Chlorinolysis, Phase 3.
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Telecommunications in Cometary Environments.
N82-11340/8 1234

JPL-PUB-81-85
Irrigation Market for Solar Thermal Parabolic Dish Systems.
N82-11549/4 1182

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A Proposed New Policy for Planetary Protection.
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Radiative Transfer in Cometary Dust Atmospheres: Critique of Recent Developments.
N82-12015/5 1083

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A Proposed New Policy for Planetary Protection.
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NASA-CR-164949
Assessment of Advanced Coal Gasification Processes.
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N82-11435/6 1228

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Irrigation Market for Solar Thermal Parabolic Dish Systems.
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Telecommunications in Cometary Environments.
N82-11340/8 1234

NASA-CR-164957
Coal Desulfurization by Low Temperature Chlorinolysis, Phase 3.
N82-11145/1 1209

NASA-CR-164958
Evaluation of the Micro-Carburetor.
N82-11994/2 1271

NASA-CR-164959
Fracture Mechanics of Cellular Glass.
N82-11209/5 1189

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Secondary and Compound Concentrators for Parabolic Dish Solar Thermal Power Systems.
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The Telecommunications and Data Acquisition Report.
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Using DOE-2 at Lawrence Berkeley Laboratory.
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Xi exp 0 Hyperon in the pi exp - p Interactions at 16 GeV/C.
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Comparative Investigation of the Stability of One-Dimensional and Spherical Symmetric Solitons of the Scalar Field with Self-Interaction Jsub(Mu)Jsup(Mu).
JINR-R-2-12232 1261

JOINT INST. FOR NUCLEAR RESEARCH, DUBNA (USSR). LAB. OF HIGH ENERGY.

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JINR-E-1-11975 1258

Proton Multiplicity Distribution of High-Energy Pion-Nuclei Collisions.
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Proton Multiplicity Distributions in High-Energy Hadron-Nuclei Collisions.
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Comparison of Charged Particle Multiplicity Distributions in p Tilde p and Pp Interactions and Verification of the Dual Unitarization Scheme.
JINR-E-1-12306 1258

Correlations of Identical Particles in the "Resonance + Particle" System.
JINR-R-2-12302 1258

Relativistic Quantum Mechanics of Scalar Field.
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JINR-R-1-12315 1258

Connection Between the Spin Magnetic Moment of an Electron and the Dirac Monopole.
JINR-R-2-11338 1261

Nucleus-Nucleus Interaction in the Glauber Approximation.
JINR-R-2-12079 1258

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JINR-E-2-12127 1258

OSp(1,4)-Superfields in Chiral Representation.
JINR-E-2-12364 1261

Special Relativistic Two-Body Problem. 1. Past.
JINR-E-2-12390 1261

Gravitational Axial Superfield and the Formalism of Differential Geometry.
JINR-E-2-12511 1261

Hadron Production in Quark Combination with Colors.
JINR-R-2-12154 1258

Investigation of the Problem of Massive Particle Capture by Quantum Scalar Field. Determination of the Effective Mass of the System.
JINR-R-2-12470 1259

Shape of Fast Rotating Heated Nuclei. Calculation Results.
JINR-R-4-12399 1259

Weak and Electromagnetic Characteristics of Pseudoscalar Mesons in the Nonlocal Quark Model.
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(ESD-TR-81-268)
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JA-5251
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(ESD-TR-81-269)
AD-A107 232/1 1200

JA-5252
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MS-5406
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MS-5433
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MS-5648
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PB82-139569 1110

MTR-7490
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E-621
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E-668
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E-709
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E-922
Solar Cell Development for the Power Extension Package.
N82-11551/0 1187

E-993
Universal Binding Energy Relations in Metallic Adhesion.
N82-11183/2 1189

E-995
Integrated Analysis of Engine.
N82-11491/9 1078

E-999
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N82-11182/4 1193

E-1003
Voltage Gradients in Solar Array Cavities as Possible Breakdown Sites in Spacecraft-Charging-Induced Discharges.
N82-11107/1 1186

E-1024
Testing of a Spacecraft Model in a Combined Environment Simulator.
N82-11106/3 1273

E-1027
A Summary of V/STOL Inlet Analysis Methods.
N82-11043/8 1077

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E-1045
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N82-10390/4
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N82-10862/2
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PAT-APPL-6-276 748 1179

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Focal Axis Resolver for Offset Reflector Antennas.
PAT-APPL-6-308 009 1179

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Real-Time 3D X-Ray and gamma-Ray Viewer.
PAT-APPL-6-267 178 1179

NASA-CASE-GSC-12650-1
Tuned Analog Network.
PAT-APPL-6-301 077 1179

NASA-CASE-GSC-12686-1
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N82-11046/1 1254

L-13950
Research in Nonlinear Structural and Solid Mechanics.
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L-14423
Amplified Crossflow Disturbances in the Laminar Boundary Layer on Swept Wings with Suction.
N82-11391/1 1078

L-14533
An Improved Transverse Shear Deformation Theory for Laminated Antisotropic Plates.
N82-11488/5 1262

L-14575
Effects of Vortex Flaps on the Low-Speed Aerodynamic Characteristics of an Arrow Wing.
N82-11013/1 1077

L-14606
Parametric Study of Microwave-Powered High-Altitude Airplane Platforms Designed for Linear Flight.
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L-14666
Wind-Tunnel Results for a Modified 17-Percent-Thick Low-Speed Airfoil Section.
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An Algorithm for Minimum-Cost Set-Point Ordering in a Cryogenic Wind Tunnel.
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Some Observations on a New Numerical Method for Solving Navier-Stokes Equations.
N82-11032/1 1254

NASA-CP-2147-Sup
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N82-11817/5 1174

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The Effects of Lateral Aerodynamic Uncertainties on the Handling Qualities of the Space Shuttle Orbiter at Mach Numbers of 1.5 and .6.
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Space Shuttle Main Engine Controller.
N82-11784/7 1273

N82-10359/9
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PAT-APPL-6-297 486 1224

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N82-11311/9 1225

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N82-11054/5 1078

A-8746
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N82-11018/0 1076

N82-10228/6
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Radiative Cooler.
PAT-APPL-6-284 289 1201

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Synthetic Aperture Radar Target Simulator.
PAT-APPL-6-284 287 1238

N82-10496/9
Solar Energy Modulator.
PAT-APPL-6-284 286 1183

NASA-CASE-NPO-15024-1
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HRP-0903693/0 1124

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HRP-0903700/3 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Illinois, Volume 14, Part 2.
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HRP-0903702/9 1125

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Indiana, Volume 15, Part 2.
HRP-0903703/7 1125

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HRP-0903704/5 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kansas, Volume 16, Part 2.
HRP-0903705/2 1126

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HRP-0903707/8 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Louisiana, Volume 18, Part 1.
HRP-0903708/6 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Louisiana, Volume 18, Part 2.
HRP-0903709/4 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Massachusetts, Volume 21.
HRP-0903710/2 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Maine, Volume 19.
HRP-0903711/0 1126

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Maryland, Volume 20.
HRP-0903712/8 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Tennessee, Volume 42, Part 1.
HRP-0903713/6 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Tennessee, Volume 42, Part 2.
HRP-0903714/4 1127

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HRP-0903715/1 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Pennsylvania, Volume 38, Part 2.
HRP-0903716/9 1127

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HRP-0903717/7 1127

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: South Carolina, Volume 40.
HRP-0903718/5 1127

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PB82-144999 1101

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PB82-136847 1215

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ARL/PSU/TM-81-181
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AD-A107 393/1 1149

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N82-11031/3 1270

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AD-A107 474/9 1149

PENNSYLVANIA STATE UNIV., UNIVERSITY PARK. DEPT. OF MECHANICAL ENGINEERING.

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AD-A107 147/1 1271

CORPORATE AUTHOR INDEX

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PSU-IRL-FR-81/1
Ionization and Aerosol Particulates in the Middle Atmosphere.
(ARO-15733.1-GS)
AD-A107 361/8 1084

PENNSYLVANIA UNIV., PHILADELPHIA.

TR-6
Structure Study of Oxygen-Adsorbed Ni(111) Surface by High Energy Ion Scattering.
AD-A107 528/2 1150

TR-81-6
Solitons in Polyacetylene: Effects of Dilute Doping on Optical Absorption Spectra.
AD-A106 964/0 1148

TR-81-7
Photoconductivity in Polyacetylene.
AD-A106 965/7 1194

TR-81-8
Inter-Soliton Electron Hopping Transport in Trans-(CH)x.
AD-A106 966/5 1263

PERKIN-ELMER CORP., DANBURY, CT.

NASA-CR-165683
Development of MBE Grown Pb-Salt Semiconductor Lasers for the 8.0 to 15.0 Micrometer Spectral Region.
N82-11453/9 1255

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(NSF/PRA-81006)
PB82-128604 1091

81-1A
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PB82-128612 1091

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PB82-137597 1238

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TR-EE81-25
An Application of Syntactic Pattern Recognition to Seismic Discrimination,
AD-A107 383/2 1238

QUEEN MARY COLL., LONDON (ENGLAND).

Environmental Failure of Adhesive Bonding in Composites.
AD-A107 538/1 1190

RADCLIFFE SCIENCE LIBRARY (ENGLAND).

RSL/ENG-673/2
The Use of Applicative Programming in Data Processing.
PB82-136219 1176

RSL/ENG-673/5
A Reappraisal of the Use of IDMS for the Radcliffe Science Library Serials Handling System,
PB82-136227 1096

RADIAN CORP., AUSTIN, TX.

On-Site GC/MS Analysis of Chapman Gasification Separator Liquor.
(EPA-600/7-81-136)
PB82-107285 1152

RAND CORP., SANTA MONICA, CA.

RAND/N-731-ARPA
AUTOPILOT: A Distributed Planner for Air Fleet Control.
AD-A107 139/8 1236

RAND/N-1298-HUD
Relevance to HUD of Recent Scholarly Research in Urban Economics,
(HUD-0002048)
PB82-144452 1101

RAND/N-1309-HUD
Codebook for the Household Survey, Site I, Wave 3. Housing Assistance Supply Experiment,
(HUD-0002107)
PB82-144908 1119

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(HUD-0002113)
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Audit of the Survey of Residential Buildings, Site I, Wave 3. Housing Assistance Supply Experiment,
(HUD-0002112)
PB82-144932 1119

RAND/R-2805-ARMY
Spatial Learning and Reasoning Skill.
AD-A107 345/1 1112

RASOR ASSOCIATES, INC., SUNNYVALE, CA.

DOE/NASA/51040/33
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N82-11993/4 1271

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(FHWA/RD-81/003)
PB82-137639 1215

Field Study of Pile Group Action. Appendix B.
(FHWA/RD-81/004)
PB82-137647 1215

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Urban Infill: Opportunities and Constraints.
(HUD-0000833)
PB82-144304 1216

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(HUD-0002073)
PB82-144635 1184

Marketing and Market Acceptance Data From the Residential Solar Demonstration Program: 1980. Volume 2: Technical Appendix.
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N82-11099/0 1272

RENSSELAER POLYTECHNIC INST., TROY, NY. DEPT. OF ELECTRICAL COMPUTER AND SYSTEMS ENGINEERING.

NASA-CR-164972
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N82-11959/5 1171

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RPI-MATH-131
Refracted Ray Characteristics from the Geometrical Spreading Equation for Depth-Dependent Media.
AD-A107 216/4 1252

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(ARO-16498.3-EL)
AD-A107 014/3 1170

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Economic Impact and Project Selection Methodology for Certificate of Need.
HRP-0903735/9 1129

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NASA-CR-166716
Thermal Algorithms Analysis.
N82-11800/1 1174

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PB82-138579 1100

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TR-14
Laser-Stimulated Molecular Dynamics and Rate Processes.
AD-A107 246/1 1149

ROCHESTER UNIV., NY. INST. OF OPTICS.

Engineering Aspects of Gradient-Index Optical Systems.
(NSF/RA-780916)
PB82-131996 1256

ROCKWELL INTERNATIONAL, CANOGA PARK, CA. ROCKETDYNE DIV.

NASA-CR-165379
Advanced Superposition Methods for High Speed Turbopump Vibration Analysis.
N82-11465/3 1225

NASA-CR-165487
Liquid Oxygen Turbopump Technology.
N82-11468/7 1225

RI/RD81-149
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N82-11465/3 1225

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Liquid Oxygen Turbopump Technology.
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AD-A106 986/3 1077

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The Activity Fuel Appraisal Process: Instructions and Examples.
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FSGTR-RM-84
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PB82-108093 1169

ROME AIR DEVELOPMENT CENTER, GRIFFISS AFB, NY.

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Propagation Study for a Tropospheric Transhorizon Radar.
AD-A107 039/0 1264

Programming Support Library (PSL).
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ROME AIR DEVELOPMENT CENTER, HANSCOM AFB, MA. DEPUTY FOR ELECTRONIC TECHNOLOGY.

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Optical Processing of Photographic Images.
AD-A107 212/3 1230

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Reprint-2582
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AD-A107 149/7 1148

The Equation of State of D2O Determined from Sound Speeds.
AD-A107 203/2 1149

Densities of NaCl, MgCl2, Na2SO4, and MgSO4 Aqueous Solutions at 1 atm from 0 to 50 C and from 0.001 to 1.5 m.
AD-A107 207/3 1149

Review of the Experimental and Analytical Methods for the Determination of the Pressure-Volume-Temperature Properties of Electrolytes.
AD-A107 208/1 1149

The Carbonate System in the Western Mediterranean Sea.
AD-A107 390/7 1168

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RAE-TM-AERO-1891
The Design of a 'Jet Catcher'.
(DRIC-BR-78582)
AD-A106 968/1 1253

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Applications of the Microscan 9 Microanalyser.
(DRIC-BR-77779)
AD-A106 969/9 1148

RAE-TM-MAT-375
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(DRIC-BR-79976)
AD-A106 970/7 1194

RAE-TM-SPACE-287
A True Air Speed Sensor for Miniature Unmanned Aircraft.
(DRIC-BR-80019)
AD-A106 967/3 1079

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RSRE-MEMO-2875
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(DRIC-BR-64523)
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(HUD-0002098, HUD/PDR-625)
PB82-144825 1118

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PB82-136243 1269

SANDIA NATIONAL LABS., ALBUQUERQUE, NM.

CONF-810923-9
Effect of Thermomechanical Properties on Initial Cavity Growth.
DE81030839 1161

CONF-810953-2
Aqueous Dissolution of Calcium Metaphosphate Glasses.
DE81030130 1189

CONF-811103-5
Experimental Source Term Data Base for Assessing the Safety of Spent Fuel Transportation.
DE81023692 1243

CONF-811103-9
Sensitivity Analysis of Transportation Parameters on Spent-Fuel-Cask Projections.
(-TTC---0229)
DE81025833 1243

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Disruption Scenarios for a Nuclear-Waste Repository on the Nevada Test Site.
DE81030844 1243

CONF-811119-2
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DE81030840 1243

CONF-8106158-1
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DE81030128 1196

SAND-80-1626
Pathfinding Simulation (PATHS) User's Guide,
NUREG/CR-1589 1249

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DE81030991 1138

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SAND-81-0978
Analysis and Leak Tests of Wells for New Solution Mined Caverns at the Bryan Mound DOE-SPR Storage Site.
DE82000244 1267

SAND-81-1156
Vertical Axis Wind Turbine Control Strategy.
DE81031932 1181

SAND-81-1188C
Experimental Source Term Data Base for Assessing the Safety of Spent Fuel Transportation.
DE81023692 1243

SAND-81-1232
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DE82000517 1157

SAND-81-1417C
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(-CONF--811103--2)
DE81024032 1242

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SAND-81-1966C
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SAND-81-7034
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SAND-81-7100-V.1
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TTC-0225
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N81-29500/8 1169

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N81-29500/8 1169

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RL-81-072
Low-Temperature Theories of the Classical One-Dimensional Easy-Plane Ferromagnet: Successes and Limitations,
PB82-131665 1263

RL-81-073
Spin-Wave Damping in the Quantum Ising-Heisenberg Chain,
PB82-134149 1263

SCIENCE AND ENGINEERING RESEARCH COUNCIL, CHILTON (ENGLAND). RUTHERFORD APPLETON LAB.

RL-81-074
Heat Energy Recovery from Domestic Output Fluids (HERDOF),
PB82-134156 1188

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On the Design of Simulations of Command and Control Processes.
(ARI-RN-80-39)
AD-A107 423/6 1108

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RL-81-062
Control Panels - Layout and Design,
PB82-132051 1222

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The Prevalence of Rape and Sexual Assault.
(NIMH-81-46)
PB82-134537 1096

SCS ENGINEERS, COVINGTON, KY.

Survey of On-Going and Completed Remedial Action Projects.
(EPA-600/2-81-246)
PB82-134115 1213

SHANGHAI FIRST MEDICAL COLL. (CHINA).

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PB82-135997 1099

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N82-12004/9 1082

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(AFGL-TR-81-0238)
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(IWS-35.31)
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Industrial Hygiene Survey Report at U.S. Gypsum Corporation, Birmingham, Alabama.
(IWS-35.32)
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Machine Intelligence Research Applied to Industrial Automation.
(NSF/RA-780918)
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Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Executive Summary.
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STANFORD UNIV., CA.

The Time-Sequenced Adaptive Filter.
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Multichannel Adaptive Filtering for Signal Enhancement.
AD-A106 910/3 1233

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Research on Metal Halide Laser Systems.
AD-A107 398/0 1255

STANFORD UNIV., CA. DEPT. OF COMPUTER SCIENCE.
STAN-CS-81-855
Deductive Synthesis of the Unification Algorithm,
AD-A107 328/7 1173

STANFORD UNIV., CA. INFORMATION SYSTEMS LAB.
Adaptive Design of Digital Filters.
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Higher-Level Simulations of Turbulent Flows.
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Mixing of a Passive Scalar in Isotropic and Sheared Homogeneous Turbulence.
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A Three-Dimensional Simulation of Transition and Early Turbulence in a Time-Developing Mixing Layer.
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N82-11396/0 1254

SU-TF-13
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SU-TF-14
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N82-11068/5 1271

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ONWI-95 1158

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ORO-3852-36 1246

Uranium and Thorium Series Nuclides in River Sediments and River Water.
ORO-3852-37 1246

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ORO-3852-38 1246

Distribution of Actinide Elements in Sediments: Leaching Studies.
ORO-3852-39 1156

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GJBX-23(79)(V.2-A) 1163

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GJBX-23(79)(V.2-B) 1163

Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Arizona--New Mexico, Tucson Quadrangle.
GJBX-23(79)(V.2-C) 1163

Study of Airborne gamma-Ray Spectrometer Data Procedures: Wind River Basin, Wyoming, Casper Quadrangle.
GJBX-40(79)(V.2-A) 1163

Study of Airborne gamma-Ray Spectrometer Data Procedures: Wind River Basin, Wyoming, Arminto Quadrangle.
GJBX-40(79)(V.2-B) 1163

Study of Airborne gamma-Ray Spectrometer Data Procedures: Wind River Basin, Wyoming, Thermopolis Quadrangle.
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Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Ohio and West Virginia: Charleston Quadrangle. Final Report.
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CONF-800824-18
Polarimeter for Protons Between 300 and 800 MeV.
LA-UR-80-1943 1241

Acceleration of Methane-Air Ignition by Hydrocarbon Additives.
(ARO-15826.9-C)
AD-A107 009/3 1272

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(ARO-15466.5-C)
AD-A107 389/9 1195

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National Dam Safety Program. Lake Casse Dam (Inventory Number N.Y. 1156), Lower Hudson River Basin, Putnam County, New York. Phase I Inspection Report.
AD-A107 405/3 1206

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AD-A107 406/1 1206

National Dam Safety Program. Mamaroneck Reservoir Dam (Inventory Number N.Y. 111), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 407/9 1206

National Dam Safety Program. Kirk Lake Dam (Inventory Number N.Y. 682), Lower Hudson River Basin, Putnam County, New York. Phase I Inspection Report,
AD-A107 408/7 1206

National Dam Safety Program. White Plains Reservoir Dam Number 2 (Inventory Number N.Y. 24), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 409/5 1207

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AD-A107 410/3 1207

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AD-A107 417/8 1207

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AD-A107 419/4 1208

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Determining Optimum Routes from Maps,
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(FSWEC-79/0105)
PB82-121872 1175

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AD-A107 539/9 1178

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433
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PB82-135385 1226

434
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442
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PB82-136011 1224

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Control of Building Engineering Services. Part 4: Hardware Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
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CONTROL SYSTEMS CENTRE-446
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PB82-136953 1177

CONTROL SYSTEMS CENTRE-447
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PB82-134719 1092

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CONTROL SYSTEMS CENTRE-449
SYCOL: A High Level Language for Applications in Real Time Control Systems,
PB82-135666 1176

CONTROL SYSTEMS CENTRE-451
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PB82-135674 1199

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PB82-135682 1199

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PB82-134776 1176

CONTROL SYSTEMS CENTRE-458
Interactive Maximum Likelihood Estimation,
PB82-134784 1198

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PB82-134578 1198

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1
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(AD-E001-182)
AD-A106 865/9 1105

2
Systems Are Not Solutions: Issues in Creating Information Systems That Account for the Human Organization.
(AD-E001-184)
AD-A106 866/7 1094

81-5(11)
An Appraisal of Performance Appraisal Summary Results of a Large Scale Study.
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81-6(12)
Systems Are Not Solutions: Issues in Creating Information Systems That Account for the Human Organization.
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1216-1
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PB82-121856 1175

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PB82-135237 1132

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AD-A106 954/1 1120

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AD-A106 962/4 1141

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PB82-130063 1229

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FOUNDATION PAPER-528
Value Theory without Efficiency.
AD-A107 085/3 1199

YOUNG (ARTHUR) AND CO., WASHINGTON, DC.

A Profile of the Medical Technology Industry and Governmental Policies. Volume I.
(NCHSR-81-223)
PB82-141821 1100

A Profile of the Medical Technology Industry and Governmental Policies: A Study of the Effects of Medicare/Medicaid Reimbursement and the 1976 Medical Device Amendments on the Pacemaker Industry. Volume II.
(NCHSR-81-224)
PB82-141839 1100

A Profile of the Medical Technology Industry and Governmental Policies. Appendix A: Review and Assessment of Secondary Data Sources for Developing a Profile of the Medical Technology Industry.
(NCHSR-81-225)
PB82-141847 1141

ZHANJIANG MEDICAL COLL. (CHINA).

Determination of Estrogen Receptor in Human Colon Cancer Tissue with Labeled Fluorescence Estradiol (Fluorescein Isothiocyanate),
PB82-129719 1131

CONTRACT/GRANT NUMBER INDEX

NTIS®

Entries in this index list reports produced as a result of research done under specific contract or grant numbers. Entries are arranged first, alphanumerically, by the contract or grant number, and then by the corporate or performing organization.

SAMPLE ENTRY

NSF-ENV77-18339
Massachusetts Inst. of Tech., Cambridge. Constructed Facilities Div.
PB80-104045 33

Contract or grant number
Performing organization
NTIS order number Page number

AB01-77ET10069
Exxon Research and Engineering Co., Florham Park, NJ.
DOE/ET/10069-T1(V.2) 1146
DOE/ET/10069-T1(V.3) 1146
DOE/ET/10069-T7(V.1) 1146
DOE/ET/10069-T7(V.2) 1146

AC01-77ET20009
United Technologies Corp., Windsor Locks, CT. Hamilton Standard Div.
DE81029028 1266

AC01-77RG08753
Department of Energy, Washington, DC. Economic Regulatory Administration.
DOE/EA-0061 1209

AC01-78ET25425
SRI International, Menlo Park, CA.
DE81027235 1187

AC01-79CS0231
Systems Technology Corp., Xenia, OH.
DE82000808 1268

AC01-79CS30027
Automation Industries, Inc., Silver Spring, MD. Vitro Labs. Div.
DE82000071 1084

AC01-79ET14210
Battelle Columbus Labs., OH.
DE81031974 1161

AC02-76CH00016
Associated Universities, Inc., Washington, DC.
DE81030035 1239
DE81030735 1120
Brookhaven National Lab., Upton, NY.
DE81029917 1239
DE81030030 1181
DE81030213 1200
DE82000067 1151
DE82000173 1186
DE82000252 1181
National Center for Analysis of Energy Systems, Upton, NY.
DE81030997 1181
DE82000433 1221

AC02-76ER00038
Notre Dame Univ., IN. Radiation Lab.
DE81030942 1155

AC02-76ER01198
Illinois Univ. at Urbana-Champaign.
DE82000059 1151
DE82000060 1151
DE82000061 1151

AC02-76ET20279
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
DE81025726 1200

AC02-77CH00178
Joint Center for Graduate Study, Richland, WA.
DE81030274 1185
Solar Energy Research Inst., Golden, CO.
DE82001158 1200

AC02-77ET11320
Montana Energy and MHD Research and Development Inst., Inc., Butte.
DE81023095 1185

AC02-78ET25309
Prototech Co., Newton Highlands, MA.
DE81030975 1185

AC02-79CS30150
Mid-American Solar Energy Complex, Minneapolis, MN.
DE82000452 1267
DE82000453 1200
DE82000456 1200
DE82000461 1268

AC02-79CS30156
Iowa Solar Office, Des Moines.
DE81030947 1200

AC02-79CS30159
Western Solar Utilization Network, Portland, OR.
DE82000514 1209

AC02-79EV10240
Purdue Univ., Lafayette, IN. Dept. of Chemistry.
DE81030958 1150

AC02-80ER10715
Purdue Univ., Lafayette, IN. Dept. of Botany and Plant Pathology.
DE81030165 1120

AC02-81ER40014
Colorado Univ. at Boulder. Nuclear Physics Lab.
DE81030972 1257

AC03-76ER00511
Hawaii Univ., Honolulu.
DE81025788 1257

AC03-76SF01123
AiResearch Mfg. Co. of Arizona, Phoenix.
DE81027473 1249

AC03-77SF01435
General Electric Co., Sunnyvale, CA.
DE81025940 1246

AC03-78ET20510
Energy and Environmental Analysis, Inc., Arlington, VA.
DE81027410 1185

AC03-78ET20535
General Atomic Co., San Diego, CA.
DE81024188 1185

AC03-79CS40208
Beet Sugar Development Foundation, Fort Collins, CO.
BSDF-38-3Q-80 1137

AC03-79ET27232
WESTEC Services, Inc., San Diego, CA.
DOE/ET/27232-T4 1162

AC04-76DP00053
Monsanto Research Corp., Miamisburg, OH.
DE82000388 1157
Mound Facility, Miamisburg, OH.
MLM-2731(OP) 1268

AC04-76DP00487
Mason and Hanger-Silas Mason Co., Inc., Amarillo, TX.
MHSMP-80-20 1250

AC04-76DP00656
Sandia National Labs., Albuquerque, NM.

DE81030130 1189

AC04-76DP00789
Sandia National Labs., Albuquerque, NM.
DE81023692 1243
DE81024032 1242
DE81025833 1243
DE81030128 1196
DE81030839 1161
DE81030844 1243
DE81030980 1138
DE81030991 1138
DE81031932 1181
DE81031934 1185
DE81031936 1186
DE82000244 1267
DE82000517 1157
DE82000820 1242

AC04-76DP03533
Atomics International Div., Golden, CO. Rocky Flats Plant.
DE81030298 1242

AC04-76GJ01658
Ford, Bacon and Davis Utah, Inc., Salt Lake City.
DE82000816 1244
DE82000817 1244

AC04-77AL03914
Westinghouse Research and Development Center, Pittsburgh, PA.
ALO-4199-1 1255

AC04-77DP00053
Mound Facility, Miamisburg, OH.
MLM-2727 1240

AC04-77ET20260
General Electric Co., Philadelphia, PA. Space Div.
ALO-3985-1 1181

AC04-78AL14199
Westinghouse Research and Development Center, Pittsburgh, PA.
ALO-4199-1 1255

AC04-DP00789
Sandia National Labs., Albuquerque, NM.
DE81030840 1243

AC05-76ER04207
Texas Engineering Experiment Station, College Station.
DE82000421 1247

AC05-76ET10104
Pittsburg and Midway Coal Mining Co., Englewood, CO.
DE81031937 1145

AC05-76OR00033
Oak Ridge Associated Universities, Inc., TN.
DE81031984 1159
DE81031985 1145
Oak Ridge Associated Universities, Inc., TN. Inst. for Energy Analysis.
ORAU/IEA-80-2(M) 1182
ORAU/IEA-80-10(M) 1182
Oak Ridge Associated Universities, Inc., TN. Manpower Education, Research and Training Div.
ORAU-168 1166

AC05-78OR13410
Oak Ridge National Lab., TN.
IITRI-M-6043-6(QTPR) 1268

AC06-76RL0183
Los Alamos Scientific Lab., NM.
LA-8389-PR 1249

AC06-76RL01830
Battelle Pacific Northwest Labs., Richland, WA.
DE82000697 1246
DE82000708 1244
Terra Tek, Inc., Salt Lake City, UT.
ONWI-95 1158

AC07-76ID01570
EG and G Idaho, Inc., Idaho Falls.
EGG-LO-MR-007 1247

AC08-76NV01183
EG and G, Inc., Las Vegas, NV. Energy Measurements Group.
DE82000434 1246

AC08-78DP40020
Honeywell Corporate Material Sciences Center, Bloomington, MN.
NVO-1555-5 1255

AC08-79BC10003
CER Corp., Las Vegas, NV.
DE82000709 1162

AC09-76SR00001
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
DE81030490 1243
DE81030827 1245
DE82000035 1243
DE82000408 1244
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Plant.
DE81030403 1243
DE81030405 1090

AC13-76GJ01664
EG and G GeoMetrics, Sunnyvale, CA.
GJBX-149(80) 1162
GJBX-150(80) 1162
GJBX-151(80) 1162
GJBX-152(80) 1162
GJBX-153(80) 1163
GJBX-154(80) 1163
GJBX-155(80) 1163
Texas Instruments, Inc., Dallas. Airborne Geophysical Services.
GJBX-136(80) 1162
Western Geophysical Co. of America, Houston, TX. Aero Service Div.
DE82000338 1161

AC14-76FF02170
Hanford Engineering Development Lab., Richland, WA.
HEDL-TME-79-6 1192

AC21-76ET10389
Combustion Engineering, Inc., Windsor, CT.
DE82000122 1265

AC21-78MC16823
Science Applications, Inc., Morgantown, WV.
DE81030377 1161

AC21-79ET15167
Aerojet Energy Conversion Co., Sacramento, CA.
DOE/ET/15167-191 1265

AC22-76ET10154
Southern Co. Services, Inc., Birmingham, AL.
DE82000420 1145

AC22-80PC30076
United Coal Co., Bristol, VA.
DE81030967 1161

AC22-80PC30297
Energy and Environmental Research Corp., Santa Ana, CA.
DE81030860 1265

AFOSR-76-3063
Brown Univ., Providence, RI. Lefschetz Center for Dynamical Systems.
AD-A107 520/9 1197

AFOSR-77-3396
South Carolina Univ., Columbia. Dept. of Mathematics and Statistics.
AD-A106 962/2 1263

AFOSR-80-0211
Maryland Univ., College Park. Dept. of Mathematics.
AD-A106 981/4 1196

AFOSR-80-0233
Massachusetts Inst. of Tech., Cambridge.
AD-A107 089/5 1148

AFOSR-81-0014
Stanford Univ., CA. Dept. of Computer Science.
AD-A107 328/7 1173

AFOSR-81-0079
Grambling State Univ., LA.
AD-A107 138/0 1144

AFOSR-81-0236
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Electrical Engineering.
AD-A107 031/7 1196

AI01-76ET53020
Naval Research Lab., Washington, DC.
NRL-MR-4213 1240

AI01-76RA50090
Johns Hopkins Univ., Laurel, MD. Applied Physics Lab.
JHU/APL-QM-80-101 1201

AI01-77DP40042
Naval Research Lab., Washington, DC.
NRL-MR-4180 1240

AI01-77ET10350
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
DE82000419 1265

AI01-77ET10769
Avco-Everett Research Lab., Inc., Everett, MA.
DE81030882 1185

AI01-77RA11025
Institute for Water Resources (Army), Fort Belvoir, VA.
DOE/RA/11025-T1(V.1) 1186

AI03-79ET33062
Jet Propulsion Lab., Pasadena, CA.
DE81024236 1185
DE81024237 1185

AI04-80AL12726
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
DE82000415 1186

AID/OTR-G-1477
International Center for Research on Women, Washington, DC.
PB82-133232 1114

AID-PHA-C-1100
American Public Health Association, Washington, DC.
PB82-131491 1114

AID/PHA-G-1184
Elmendorf (Mary), Washington, DC.
PB82-131061 1131

AID/TA-BMA-5
Minnesota Univ., Minneapolis. Dept. of Agriculture and Applied Economics.
PB82-134552 1080

AID-504-INST-781
Nathan (Robert R.) Associates, Inc., Washington, DC.
PB82-131442 1114

ARB-A8-123-31
Pacific Environmental Services, Inc., Santa Monica, CA.
PB82-124405 1183

ARPA ORDER-600
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
AD-A107 057/2 1178
AD-A107 061/4 1236

ARPA ORDER-2006
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
AD-A107 063/0 1233

ARPA ORDER-2397
Florida Univ., Gainesville. Dept. of Electrical Engineering.
PB82-135864 1263

ARPA ORDER-2551
Systems, Science and Software, La Jolla, CA.
AD-A107 359/2 1241
AD-A107 360/0 1168

ARPA ORDER-2840
Stanford Univ., CA. Dept. of Chemistry.
AD-A107 398/0 1255

ARPA ORDER-3045
Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.
AD-A107 140/6 1233
AD-A107 462/4 1173

ARPA ORDER-3503
Eastman Kodak Co., Rochester, NY. Kodak Apparatus Div.
AD-A106 998/8 1222

ARPA ORDER-3693
Global Marine Development, Inc., Newport Beach, CA.
AD-A106 991/3 1168

ARPA ORDER-4035
Naval Postgraduate School, Monterey, CA.
AD-A107 439/2 1270

AS02-76ER03158
Cornell Univ., Ithaca, NY.
DE82000655 1252

AS02-76EV02403
Massachusetts General Hospital, Boston.
DE82000396 1120

AS02-78ER04903
Colorado State Univ., Fort Collins.
DE81030169 1150

AS02-79ER10396
Colorado Univ. at Boulder.
DE82000688 1151

AS03-78ET13095
Utah Univ., Salt Lake City. Coll. of Mines and Mineral Industries.
DE82000482 1161

AS05-76ER01797
Florida State Univ., Tallahassee. Dept. of Chemistry.
DE81030542 1150

AS05-76ER04535
Texas Southern Univ., Houston. Dept. of Chemistry.
DE81030061 1150

AS05-76EV02832
Texas Univ. System Cancer Center, Houston.
ORO-2832-213 1143

AS05-76EV03852
Texas A and M Research Foundation, College Station.
ORO-3852-36 1246
ORO-3852-37 1246
ORO-3852-38 1246
ORO-3852-39 1156

AS05-78EV05888
Florida State Univ., Tallahassee.
DE81030486 1120
Florida State Univ., Tallahassee. Inst. of Molecular Biophysics.
DE82000153 1121

AS05-78OR06102
Florida Univ., Gainesville. Coll. of Engineering.
DE81025021 1242

AS06-77ET28476
Oregon Inst. of Tech., Klamath Falls. Geo-Heat Utilization Center.
DOE/ET/28476-T2 1162

ASL-79-8116
Army Engineer Waterways Experiment Station, Vicksburg, MS. Environmental Lab.
AD-A107 338/6 1236

AT01-76ET10696
Massachusetts Inst. of Tech., Cambridge.
MIT-2295T9-15 1182

AT03-76ET28384
University of Southern California, Los Angeles. Dept. of Petroleum Engineering.
DOE/ET/28384-T1 1162

AT03-76ET51011
General Atomic Co., San Diego, CA.
DE82000082 1248

AT03-76SF70030
General Electric Co., Sunnyvale, CA. Advanced Reactor Systems Dept.
DE81027453 1247

AT03-76SF70046
General Atomic Co., San Diego, CA.
GA-A-15837 1242

AT03-76SF71031
General Electric Co., Sunnyvale, CA. Advanced Reactor Systems Dept.
DE81027367 1247

CERL-08684-004-10
Dames and Moore, Cranford, NJ.
AD-A107 239/6 1205

DA-ARO-D-31-124-73-G118
University of Southern California, Los Angeles. Dept. of Aerospace Engineering.
AD-A107 213/1 1228

DA-ERO-78-G-010
Cambridge Univ. (England). Dept. of Metallurgy and Materials Science.
AD-A107 501/9 1189

DA-ERO-78-G-118
Queen Mary Coll., London (England).
AD-A107 538/1 1190

DA-ERO-79-G-0035
Newcastle upon Tyne Univ. (England).
AD-A107 516/7 1192

DA-49-092-ARO-158
HRB-Singer, Inc., State College, PA.
AD-A107 529/0 1173

DAAB07-77-C-0569
Westinghouse Defense and Electronic Systems Center, Baltimore, MD.
AD-A107 339/4 1178

DAAB07-78-C-2992
TRW Defense and Space Systems Group, Redondo Beach, CA.
AD-A107 539/9 1178

DAAG29-73-C-0025
California Univ., Berkeley.
AD-A107 275/0 1197

DAAG29-76-G-0303
Northwestern Univ., Evanston, IL. Dept. of Materials Science.
AD-A107 013/5 1252

DAAG29-77-G-0005
University of Southern California, Los Angeles. Dept. of Mathematics.
AD-A107 492/1 1197

DAAG29-77-G-0102
Virginia Polytechnic Inst. and State Univ., Blacksburg.
AD-A107 158/8 1195

DAAG29-77-G-0164
Wayne State Univ., Detroit, MI. Dept. of Mathematics.
AD-A107 144/8 1197

DAAG29-77-G-0202
University of Southern California, Los Angeles.
AD-A107 386/5 1263

DAAG29-78-C-0007
IBM Thomas J. Watson Research Center, Yorktown Heights, NY.
AD-A107 155/4 1263
AD-A107 157/0 1252

DAAG29-78-C-0011
California Inst. of Tech., Pasadena.
AD-A107 010/1 1253
AD-A107 011/9 1196

DAAG29-78-C-0028
Battelle Columbus Labs., OH.
AD-A107 493/9 1256

DAAG29-78-G-0129
Pennsylvania State Univ., University Park. Ionosphere Research Lab.
AD-A107 361/8 1084

DAAG29-78-G-0174
Texas Univ. at Austin.
AD-A107 009/3 1272

DAAG29-78-G-0176
Columbia Univ., New York.
AD-A107 387/3 1224

DAAG29-78-G-0182
Wayne State Univ., Detroit, MI. Dept. of Physics.
AD-A107 388/1 1228

DAAG29-78-G-0193
Illinois Univ. at Urbana-Champaign.
AD-A107 160/4 1149

DAAG29-78-G-0207
Texas Univ. at Austin. Dept. of Chemical Engineering.
AD-A107 389/9 1195

DAAG29-79-C-0053
Panametrics, Inc., Waltham, MA.
AD-A107 278/4 1253

DAAG29-79-C-0061
Colorado State Univ., Fort Collins. Dept. of Chemistry.
AD-A107 224/8 1147

DAAG29-79-C-0064
Maryland Univ. Baltimore County, Baltimore. Dept. of Mathematics.
AD-A107 018/4 1196

DAAG29-79-C-0069
State Univ. of New York at Stony Brook.
AD-A107 153/9 1195
State Univ. of New York at Stony Brook. Dept. of Chemistry.
AD-A107 161/2 1195

DAAG29-79-C-0079
Columbia Univ., New York.
AD-A107 218/0 1256

DAAG29-79-C-0088
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Mechanical Engineering, Aeronautical Engineering and Mechanics.
AD-A107 014/3 1170

DAAG29-79-C-0121
Cornell Univ., Ithaca, NY.
AD-A107 163/8 1264

DAAG29-79-C-0128
Alabama Univ., University. Dept. of Chemistry.
AD-A106 913/7 1194

DAAG29-79-C-0137
University of Southern California, Los Angeles. Dept. of Aerospace Engineering.
AD-A107 213/1 1228

DAAG29-79-C-0151
Wayne State Univ., Detroit, MI. Dept. of Physics.
AD-A107 388/1 1228

DAAG29-79-C-0204
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
N82-11211/1 1140

DAAG29-80-C-0011
Illinois Univ. at Urbana-Champaign.
AD-A106 907/9 1262
Illinois Univ. at Urbana-Champaign. Coordinated Science Lab.
AD-A106 855/0 1262

DAAG29-80-C-0033
Mississippi State Univ., Mississippi State. Dept. of Biochemistry.
AD-A107 102/6 1142
AD-A107 162/0 1142

DAAG29-80-C-0035
Northwestern Univ., Evanston, IL. Dept. of Materials Science.
AD-A107 013/5 1252

DAAG29-80-C-0062
Connecticut Univ. Health Center, Farmington.
AD-A107 012/7 1141

DAAG29-80-C-0104
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
AD-A107 128/1 1222

DAAG29-80-C-0105
Battelle Columbus Labs., OH.
AD-A107 016/8 1148

DAAG29-80-C-0131
IBM Thomas J. Watson Research Center, Yorktown Heights, NY.
AD-A107 154/7 1148

DAAG29-80-C-0135
Columbia Univ., New York.
AD-A107 387/3 1224

DAAG29-80-C-0149
Harris Corp., Melbourne, FL. Government Systems Group.
AD-A107 015/0 1227

DAAG29-80-K-0017
Houston Univ., TX. Dept. of Chemistry.
AD-A107 156/2 1149

DAAG29-80-K-0028
Wisconsin Univ.-Milwaukee.
AD-A107 020/0 1230

DAAG29-80-K-0038
Maryland Univ. Baltimore County, Baltimore. Dept. of Mathematics.
AD-A107 018/4 1196

DAAG29-80-K-0049
SRI International, Menlo Park, CA. Molecular Physics Lab.
AD-A107 017/6 1148

DAAG29-81-K-0015
Michigan Univ., Ann Arbor.
AD-A106 823/8 1229

DAAG29-81-K-0021
California Univ., Berkeley. Dept. of Electrical Engineering and Computer Sciences.
AD-A107 019/2 1178

DAAG29-81-K-0051
Colorado State Univ., Fort Collins.
AD-A107 159/6 1171

DAAG29-81-M-0092
Scanning Electron Microscopy, Inc., Chicago, IL.
AD-A107 525/8 1140

DAAG29-81-M-0120
Association for Computing Machinery, New York.
AD-A107 464/0 1197

DAAG46-71-C-0162
Ford Motor Co., Dearborn, MI.
AD-A107 522/5 1189

DAAH01-80-C-0258
Auburn Univ., AL. Engineering Experiment Station.
AD-A107 490/5 1236

DAAK10-79-C-0376
Grumman Aerospace Corp., Bethpage, NY.
AD-A107 536/5 1232

DAAK11-78-C-0116
Illinois Univ. at Urbana-Champaign. Dept. of Aeronautical and Astronautical Engineering.
AD-A107 534/0 1262

DAAK11-79-C-0110
Midwest Research Inst., Kansas City, MO.
AD-A107 346/9 1144

DAAK11-80-Q-0124
GMAF, Inc., Freeport, NY.
AD-A107 314/7 1251

DAAK20-79-C-0038
RCA Government Systems Div., Burlington, MA.
AD-A107 099/4 1227

DAAK51-79-C-0020
General Electric Co., West Lynn, MA. Aircraft Engine Group.
AD-A107 315/4 1270

DAAK70-78-C-0001
Southwest Research Inst., San Antonio, TX. Army Fuels and Lubricants Research Lab.
AD-A107 136/4 1266

DAAK70-79-C-0175
Southwest Research Inst., San Antonio, TX. Army Fuels and Lubricants Research Lab.
AD-A107 136/4 1266

DACW01-76-C-0120
Alabama Univ., University. Office of Archaeological Research.
AD-A107 171/1 1103

DACW01-77-C-0015
Mississippi State Univ., Mississippi State. Dept. of Anthropology.
AD-A107 172/9 1104

DACW01-79-C-0024
Water and Air Research, Inc., Gainesville, FL.
AD-A107 151/3 1103
AD-A107 152/1 1103

DACW43-78-C-0148
Black and Veatch, Kansas City, MO.
AD-A107 542/3 1208

DACW43-79-C-0037
International Engineering Co., Inc., San Francisco, CA.
AD-A107 504/3 1208
AD-A107 543/1 1208

DACW43-79-C-0046
Hoskins-Western-Sonderegger, Inc., Lincoln, NE.
AD-A107 540/7 1208

DACW43-79-C-0075
PRC Consoer Townsend, Inc., St. Louis, MO.
AD-A106 862/6 1203

DACW43-80-C-0063
Horner and Shifrin, Inc., St. Louis, MO.
AD-A107 353/5 1205

DACW43-80-C-0074
Black and Veatch, Kansas City, MO.
AD-A107 487/1 1208

DACW43-80-C-0094
PRC Consoer Townsend, Inc., St. Louis, MO.
AD-A106 863/4 1203

DACW43-81-C-0037
Black and Veatch, Kansas City, MO.
AD-A107 486/3 1208

DACW43-81-C-0039
Woodward-Clyde Consultants, Chicago, IL.
AD-A107 399/8 1206

DACW51-81-C-0006
Flaherty-Giavara Associates, New Haven, CT.
AD-A107 411/1 1207
AD-A107 412/9 1207
AD-A107 413/7 1207
AD-A107 414/5 1207

DACW51-81-C-0008
Tippetts-Abbett-McCarthy-Stratton, New York.
AD-A107 400/4 1206
AD-A107 401/2 1206
AD-A107 405/3 1206
AD-A107 406/1 1206
AD-A107 407/9 1206
AD-A107 408/7 1206
AD-A107 409/5 1207
AD-A107 410/3 1207
AD-A107 417/8 1207
AD-A107 418/6 1207
AD-A107 419/4 1208
AD-A107 420/2 1208
AD-A107 421/0 1208

DACW61-76-C-0192
Mississippi Univ., University. Center for Archaeological Research.
AD-A107 143/0 1103

DACW65-81-D-0020
Schnabel Engineering Associates, Richmond, VA.
AD-A107 416/0 1207

DACW67-80-C-0102
Washington Univ., Seattle. Fisheries Research Inst.
AD-A106 984/8 1155

DACW72-77-C-0013
Oregon State Univ., Corvallis. School of Oceanography.
AD-A106 973/1 1155

DACW72-79-C-0003
Kearney (A.T.), Inc., Chicago, IL.
AD-A107 366/7 1224

DAHC19-71-C-0031
HRB-Singer, Inc., State College, PA.
AD-A107 515/9 1103

DAHC19-73-C-0004
Human Resources Research Organization, Alexandria, VA.
AD-A107 535/7 1113

DAHC19-73-C-0029
System Development Corp., Santa Monica, CA.
AD-A107 530/8 1109

DAHC19-75-C-0031
System Development Corp., Santa Monica, CA.
AD-A107 316/2 1108
AD-A107 531/6 1109

DAHC19-77-C-0018
System Development Corp., Santa Monica, CA.
AD-A107 532/4 1232

DAHC19-78-C-0027
Vector Research, Inc., Ann Arbor, MI.
AD-A107 297/4 1233
AD-A107 329/5 1234

DAJA37-79-C-0505
Kingston Polytechnic, Kingston upon Thames (England).
AD-A107 237/0 1195

DAJA37-80-C-0347
Technische Univ., Munich (Germany, F.R.). Inst. fuer Hochfrequenztechnik.
AD-A107 114/1 1178

DAMD17-74-G-9378
Instituto Evandro Chagas, Belem (Brazil).
AD-A107 008/5 1123

DARPA ORDER-C-007
BDM Corp., Albuquerque, NM.
AD-A107 164/6 1256

DARPA ORDER-1849
Ford Motor Co., Dearborn, MI.
AD-A107 522/5 1189

DARPA ORDER-4287
Meridian Corp., Falls Church, VA.
AD-A107 402/0 1090

DCA100-78-C-0028
Bolt Beranek and Newman, Inc., Cambridge, MA.
AD-A107 533/2 1173

DE-AC04-76DP00789
Sandia National Labs., Albuquerque, NM.
AD-A107 044/0 1157

DE-AC39-80RC-10477
Institute for Defense Analyses, Arlington, VA.
PB82-134313 1269

DE-AI01-76ET-12548
Jet Propulsion Lab., Pasadena, CA.
N82-11516/3 1166

DE-AI01-77CS-51040
Mechanical Technology, Inc., Latham, NY.
N82-11466/1 1271

DE-AI01-77ET-12547
Jet Propulsion Lab., Pasadena, CA.
N82-11145/1 1209

DE-AI01-79CS-50080
Jet Propulsion Lab., Pasadena, CA.
N82-11994/2 1271

DE-AI01-81ET-20307
Jet Propulsion Lab., Pasadena, CA.
N82-11209/5 1189

DE-AI21-77ET-13032
Jet Propulsion Lab., Pasadena, CA.
N82-11146/9 1147

DE-AM03-76SF00326
Stanford Univ., CA. Systems Optimization Lab.
AD-A107 461/6 1199

DE-AT03-76ET53064
California Univ., Berkeley. Electronics Research Lab.
AD-A107 467/3 1260

DE-AT04-81AL-16228
Jet Propulsion Lab., Pasadena, CA.
N82-11549/4 1182

DEN3-176
Stonehart Associates, Inc., Madison, CT.
N82-11545/2 1186

DEN3-227
Mechanical Technology, Inc., Latham, NY.
N82-11466/1 1271

DHEW-100-77-0102
JWK International Corp., Annandale, VA.
PB82-107533 1113

DI-AA551-CT8-40
Science Applications, Inc., McLean, VA.
PB82-138215 1104
PB82-138223 1104
PB82-138231 1104
PB82-138249 1104

DI-AA551-CT8-52
Science Applications, Inc., La Jolla, CA.
PB82-141888 1156
PB82-141896 1156

DI-AA851-CT0-25
Texas A and M Univ., College Station. Dept. of Oceanography.
PB82-146333 1155

DI-AA851-CT0-34
Combs (Earl R.), Inc., Mercer Island, WA.
PB82-139817 1122

DI-AA851-CT0-38
Combs (Earl R.), Inc., Mercer Island, WA.
PB82-139825 1216

DI-AA5551-MU8-13
Geological Survey, Reston, VA.
PB82-109273 1158

DI-7-07-83-V0008
North American Weather Consultants, Salt Lake City, UT.
PB82-136607 1087

DI-9-07-06-V0030
ESCA-Tech Corp., Costa Mesa, CA.
PB82-109422 1104

DI-14-16-0004-78-907
Florida Game and Fresh Water Fish Commission, Vero Beach.
PB82-130808 1211

DI-14-16-0009-78-060
Urban Wildlife Research Center, Inc., Columbia, MD.
PB82-130816 1211
PB82-130824 1211

DI-14-16-0009-79-997
Argonne National Lab., IL. Div. of Environmental Impact Studies.
PB82-141359 1216

DI-14-16-0009-80-90
University of Southern Mississippi, Hattiesburg.
PB82-131426 1211
PB82-131434 1211

DI-14-34-0001-0426
National Research Council, Washington, DC. Water Resources Research Review Committee.
PB82-135559 1214

DL-B-9-M-1-0419
Boston Univ., MA.
PB82-133760 1110

DL-B-9-M-1-1009
Urban Inst., Washington, DC.
PB82-134180 1099

DL-J-9-M-0-0142
Maurizi Associates, Sacramento, CA.
PB82-134206 1110

DL-J-9-M-8-0153
Abt Associates, Inc., Cambridge, MA.
PB82-134198 1103

DL-20-51-79-39
Holt (James S.), Washington, DC.
PB82-138678 1110

DL-23-11-77-03
Brookings Institution, Washington, DC.
PB82-131558 1114

DL-91-17-79-03
Northwestern Univ., Evanston, IL.
PB82-137746 1110

DNA001-78-C-0311
JAYCOR, Alexandria, VA.
AD-A107 317/0 1241

DOC-AA-80-SAC-X8602
Applied Concepts Corp., Reston, VA.
PB82-134396 1099

DOE-EX-76-A-36-1008
Johns Hopkins Univ., Laurel, MD. Applied Physics Lab.
PB82-128679 1183

DOL-9-99-2215-0822
ACKCO, Inc., Boulder, CO.
PB82-144478 1111

DOT-CG-835285-A
Eclectech Associates, Inc., North Stonington, CT.
AD-A106 941/8 1236
AD-A107 045/7 1236
AD-A107 072/1 1236

DOT-FA79WA-4268
Boeing Commercial Airplane Co., Seattle, WA.
AD-A107 225/5 1079

DOT-FH-11-8125
SRI International, Menlo Park, CA.
PB82-133604 1213

DOT-FH-11-9145
KLD Associates, Inc., Huntington, NY.
PB82-139155 1215
PB82-139189 1216

DOT-FH-11-9315
Resource International, Inc., Worthington, OH.
PB82-136672 1215
PB82-136680 1215

DOT-FH-11-9401
Maine Dept. of Transportation, Bangor. Materials and Research Div.
PB82-132812 1213

DOT-FH-11-9526
Raymond International Builders, Inc., Houston, TX.
PB82-137639 1215
PB82-137647 1215

DOT-FH-11-9557
Sperry Systems Management, Great Neck, NY.
PB82-131673 1212

DOT-FH-11-9630
Foster-Miller Associates, Inc., Waltham, MA.
PB82-132390 1219

DOT-FR-8091
Bolt Beranek and Newman, Inc., Cambridge, MA.
PB82-138686 1222

DOT-IL-11-0027
Illinois Univ. at Urbana-Champaign. Dept. of Civil Engineering.
PB82-135542 1483

DOT-OS-80006
Thayer School of Engineering, Hanover, NH.
PB82-106436 1221

DOT-OS-90027
Charles River Associates, Inc., Boston, MA.
PB82-130907 1183

DOT-RC-92053
MITRE Corp., McLean, VA. METREK Div.
PB82-135591 1221

DOT-UT-90013
Harrington, George and Dunn, Atlanta, GA.
PB82-130857 1221

EDA-OER-620-G-78-14
Harvard-MIT Joint Center for Urban Studies, Cambridge, MA.
PB82-131608 1098

EDA-05-06-01791
Research Inst. for Community Economic Development, St. Louis, MO.
PB82-131590 1098

EDA-05-06-01835
Turtle Mountain Band of Chippewa Indians, Belcourt, ND.
PB82-134255 1099

EDA-06-06-01668-40
Madison Port Authority, IN.
PB82-131541 1211

EF-77-C-01-2577
Grace (W.R.) and Co., Memphis, TN.
FE-2577-1(V.2) 1146

EF-77-C-01-2582
Memphis Light, Gas and Water Div., TN.
FE-2582-13 1146

EG-77-C-02-4229
Mathematical Sciences Northwest, Inc., Bellevue, WA.
MSNW-78-3035(V.2) 1201

EM-75-F-01-8162
Pacific Northwest Solar Energy Association, Seattle, WA.
CONF-790845-(Sup.) 1181

EMW-02986
State Univ. of New York Upstate Medical Center, Syracuse.
PB82-106832 1130

EO-A01-78-00-3531
National Research Council, Washington, DC.
PB82-146341 1227

EPA-R-803851
Minnesota Univ., Minneapolis.
PB82-132580 1212

EPA-R-804600
Minnesota Univ., Minneapolis.
PB82-132473 1212

EPA-R-804829
Denver Research Inst., CO.
PB82-126319 1210

EPA-R-805203
Washington Univ., Seattle. Dept. of Atmospheric Sciences.
PB82-134404 1213

EPA-R-806630010
Environmental Research Lab., Gulf Breeze, FL.
PB82-128190 1136

EPA-68-01-3896
Midwest Research Inst., Kansas City, MO.
PB82-136102 1147

EPA-68-01-4839
Science Applications, Inc., McLean, VA.
PB82-139049 1215

EPA-68-01-4885
SCS Engineers, Covington, KY.
PB82-134115 1213

EPA-68-02-2688
Research Triangle Inst., Research Triangle Park, NC.
PB82-107566 1210

EPA-68-02-3137
Radian Corp., Austin, TX.
PB82-107285 1152

EPA-68-03-2577
PEDCo-Environmental, Inc., Cincinnati, OH.
PB82-136847 1215

EPA-68-03-2619
Nevada Univ., Las Vegas. Dept. of Biological Sciences.
PB82-137621 1136

EPA-68-03-2659
PEDCo-Environmental, Inc., Cincinnati, OH.
PB82-136847 1215

EPA-78-D-H0234
Dames and Moore, Cranford, NJ.
AD-A107 239/6 1205

ET-78-C-01-2578
McKee (Arthur G.) and Co., Cleveland, OH.
COO-5066-T12(V.1) 1145
COO-5066-T12(V.2) 1145

ET-78-C-03-1872
Lockheed Palo Alto Research Labs., CA.
LMSC-D-683375 1188

ET-78-C-05-3054
Southern Co. Services, Inc., Birmingham, AL.
ORO-3054-T3(App.G) 1147

ET-78-C-08-1558
Gruy Federal, Inc., Houston, TX.
NVO-1558-5(V.2) 1166

EU-78-G-01-4192
Pacific Northwest Solar Energy Association, Seattle, WA.
CONF-790845-(Sup.) 1181

EW-78-C-02-5066
McKee (Arthur G.) and Co., Cleveland, OH.
COO-5066-T12(V.1) 1145
COO-5066-T12(V.2) 1145

EW-78-S-20-0013
Sutron Corp., Arlington, VA.
LETC-0013-1 1166

EX-76-A-29-1012
Jet Propulsion Lab., Pasadena, CA.
N82-11435/6 1228
N82-11548/6 1187

EY-76-C-04-0053
Mound Facility, Miamisburg, OH.
MLM-MU-80-62-0001 1182
MLM-2664 1250
MLM-2700 1246

EY-76-C-05-5199
Department of Energy, Morgantown, WV. Morgantown Energy Technology Center.
METC/CR-79/26 1158

EY-76-C-07-1570
Exxon Nuclear Idaho Co., Inc., Idaho Falls.
CONF-791103-70 1243
Idaho National Engineering Lab., Idaho Falls.
IDO-10085 1244

EY-76-C-08-0020
Holmes and Narver, Inc., Mercury, NV.
NVO-192(V.1) 1246

EY-76-C-13-1664
Carson Helicopters, Inc., Parkasie, PA.
GJBX-92(80)(V.2A) 1165
EG and G GeoMetrics, Sunnyvale, CA.
GJBX-71(80)(V.2)(OGDEN) 1164
GJBX-71(80)(V.2)(SL) 1164
INCO, Inc., McLean, VA.
GJBX-37(79)(V.1) 1163
GJBX-37(79)(V.2) 1163
GJBX-99(79)(V.2) 1165
LKB Resources, Inc., Huntingdon Valley, PA.
GJBX-35(80)(V.2) 1163
GJBX-88(79)(V.2)MARFA 1165
GJBX-108(78)(V.1)(TYEK) 1162
GJBX-108(78)(V.2)(ANGE) 1162
Texas Instruments, Inc., Dallas.
GJBX-23(79)(V.2-A) 1163
GJBX-23(79)(V.2-B) 1163
GJBX-23(79)(V.2-C) 1163
GJBX-40(79)(V.2-A) 1163
GJBX-40(79)(V.2-B) 1163
GJBX-40(79)(V.2-D) 1163
GJBX-59(80)(V.2) 1164
GJBX-92(80)(V.2D) 1165
GJBX-92(80)(V.2E) 1165
GJBX-92(80)(V.2F) 1165
Western Geophysical Co. of America, Houston, TX. Aero Service Div.
GJBX-72(80)(V.1) 1164
GJBX-73(80)(V.1) 1164
GJBX-76(80)(V.1) 1164
GJBX-77(80)(V.1) 1164
GJBX-78(80)(V.1) 1164
GJBX-79(80)(V.1) 1164
GJBX-79(80)(V.2) 1164

EY-76-S-03-0767
California Inst. of Tech., Pasadena.
AD-A107 010/1 1253
AD-A107 011/9 1196

F08606-79-C-0008
Systems, Science and Software, La Jolla, CA.
AD-A107 359/2 1241
AD-A107 360/0 1168

F08637-80-G-0009
Engineering-Science, Inc., Atlanta, GA.
AD-A107 358/4 1205

F08637-80-G-0010
CH2M Hill, Gainesville, FL.
AD-A106 864/2 1203

F19628-73-C-0047
Syracuse Univ., NY. Dept. of Electrical and Computer Engineering.
AD-A107 521/7 1264

F19628-78-C-001
MITRE Corp., McLean, VA. METREK Div.
N82-11635/1 1209

F19628-78-C-0002
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
AD-A107 123/2 1178

F19628-78-C-0033
Oklahoma State Univ., Stillwater. Electronics Lab.
AD-A107 280/0 1086

F19628-79-C-0007
Environmental Research and Technology, Inc., Concord, MA.
AD-A107 035/8 1273

F19628-80-C-0002
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
AD-A107 050/7 1196
AD-A107 051/5 1252
AD-A107 052/3 1233
AD-A107 053/1 1252
AD-A107 054/9 1252
AD-A107 055/6 1233
AD-A107 056/4 1184
AD-A107 057/2 1178
AD-A107 058/0 1178
AD-A107 059/8 1233
AD-A107 060/6 1252
AD-A107 061/4 1236
AD-A107 062/2 1178
AD-A107 063/0 1233
AD-A107 065/5 1238
AD-A107 229/7 1172
AD-A107 230/5 1222
AD-A107 231/3 1178
AD-A107 232/1 1200
AD-A107 233/9 1252

F19628-81-K-0037
SRI International, Menlo Park, CA.
AD-A107 117/4 1083

F29601-79-C-0051
BDM Corp., Albuquerque, NM.
AD-A107 519/1 1232

F30602-77-C-0184
Avco-Everett Research Lab., Inc., Everett, MA.
AD-A106 997/0 1273

F30602-77-C-0249
IBM Federal Systems Div., Gaithersburg, MD.
AD-A107 249/5 1172
AD-A107 250/3 1172
AD-A107 251/1 1172
AD-A107 252/9 1172
AD-A107 253/7 1172

F30602-78-C-0102
Clarkson Coll. of Technology, Potsdam, NY.
AD-A107 331/1 1173

F30602-79-C-0116
Atlantic Research Corp., Rome, NY.
AD-A106 996/2 1238

F30602-81-C-0008
Eastman Kodak Co., Rochester, NY. Kodak Apparatus Div.
AD-A106 998/8 1222

F33615-77-C-1132
Michigan Univ., Ann Arbor. Electron Physics Lab.
AD-A107 043/2 1170

F33615-77-C-3075
Dayton Univ., OH. Research Inst.
AD-A107 095/2 1226
AD-A107 096/0 1226

F33615-78-C-5214
Hayya (Jack C.) Associates, State College, PA.
AD-A107 235/4 1230

F33615-80-C-0006
Honeywell Systems and Research Center, Minneapolis, MN.
AD-A107 098/6 1172
F33615-80-C-0023
General Research Corp., Mclean, VA.
AD-A107 277/6 1089
F49620-81-C-0008
California Inst. of Tech., Pasadena. Seismological Lab.
AD-A107 273/5 1168
FC02-80CS30375
Madison Industries, Inc., Conyers, GA.
DE81030496 1200
FC20-78LC10787
Geokinetics, Inc., Concord, CA.
DE81030740 1087
DE81030741 1087
FG01-79CS30013
Alabama Univ. in Huntsville. Kenneth E. Johnson Environmental and Energy Center.
DE82000488 1268
DE82000483 1268
FG16-79FC14690
Maine Office of Energy Resources, Augusta.
DE82000227 1157
FG21-78ET13383
Clarkson Coll. of Technology, Potsdam, NY.
DE81029479 1264
FG22-78ET1143
California Univ., Berkeley. Lawrence Berkeley Lab.
DE81030379 1267
FG22-80PC30213
Wisconsin Univ.-Madison. Dept. of Mechanical Engineering.
DE81030391 1265
FG22-80PC30249
Oklahoma Univ., Norman. School of Chemical Engineering and Materials Science.
DE81030363 1267
FG51-79R000079
Washington State Government, Olympia.
DE81023998 1161
GRI-5010-341-0051
American Gas Association Labs., Cleveland, OH.
PB82-141078 1138
GRI-5080-341-0320
Institute of Gas Technology, Chicago, IL.
PB82-141110 1226
GRI-5080-342-0303
Solar Turbines, Inc., San Diego, CA.
PB82-141102 1202
GRI-5080-345-0255
American Gas Association Labs., Cleveland, OH.
PB82-141060 1202
PB82-141094 1138
GRI-5080-363-0312
Calgary Univ. (Alberta). Dept. of Chemical and Petroleum Engineering.
PB82-138868 1153
H0252068
Foster-Miller Associates, Inc., Waltham, MA.
PB82-132515 1166
H0306010
GCA Corp., Bedford, MA. GCA Technology Div.
PB82-139320 1229
H0357078
General Electric Co., Wilmington, MA.
PB82-137316 1229
HCFA-500-80-0049
Orkand Corp., Silver Spring, MD.
PB82-131616 1132
HCFA-600-77-0070
Urban Inst., Washington, DC.
PB82-139908 1134
PB82-139916 1134
PB82-139924 1134
PB82-139932 1134
HCFA-600-77-0073
Lewin and Associates, Inc., Washington, DC.
PB82-138124 1134
HUD-H-1682
Massachusetts Inst. of Tech., Cambridge. Program in Industrialization of the Housing Sector.
PB82-144338 1100
PB82-144346 1100
PB82-144353 1100
PB82-144361 1100
HUD-H-1789
RAND Corp., Santa Monica, CA.
PB82-144908 1119
PB82-144932 1119
PB82-144940 1119
HUD-H-2040R
Abt Associates, Inc., Cambridge, MA.
PB82-144411 1115
PB82-145020 1119
HUD-H-2162R
Urban Inst., Washington, DC.
PB82-144445 1101
PB82-144916 1119
HUD-H-2372
Real Estate Research Corp., Chicago, IL.
PB82-144635 1184
PB82-144643 1184
PB82-144668 1116
HUD-H-2377
Franklin Research Center, Philadelphia, PA.
PB82-144676 1202
HUD-H-2384
AIA Research Corp., Washington, DC.
PB82-144684 1203
HUD-H-2405
Environmental Research and Development Foundation, Tucson, AZ.
PB82-144296 1115
HUD-H-2429-78
Rutgers - The State Univ., New Brunswick, NJ. Center for Urban Policy Research.
PB82-144825 1118
HUD-H-2606
MKGK, Inc., San Francisco, CA.
PB82-144833 1118
HUD-H-2657
Midwest Planning and Research, Inc., Minneapolis, MN.
PB82-144395 1100
HUD-H-2693
Consortium for Public Administration Field Services, Pittsburgh, PA.
PB82-144700 1093
HUD-H-2835
Harris (Louis) and Associates, Inc., New York.
PB82-141250 1115
HUD-H-2856
American Bar Association, Washington, DC. Special Committee on Housing and Urban Development Law.
PB82-145012 1119
HUD-H-2870RG
New York Univ., NY. Salomon Bros. Center for the Study of Financial Institutions.
PB82-144627 1101
HUD-H-2882
Urban Inst., Washington, DC.
PB82-144486 1116
HUD-H-2910
Peat, Marwick, Mitchell and Co., Washington, DC.
PB82-144999 1101
HUD-H-2921RG
Urban Inst., Washington, DC.
PB82-144494 1111
HUD-H-2930
RAND Corp., Santa Monica, CA.
PB82-144452 1101
HUD-H-2944RG
California Univ., Berkeley. Inst. of Governmental Studies.
PB82-144429 1216
HUD-H-2982
Real Estate Research Corp., Chicago, IL.
PB82-144304 1216
HUD-H-4434
Coalition of Northeast Municipalities, Boston, MA.
PB82-144528 1093
HUD-H-4435
Coalition of Northeast Municipalities, Boston, MA.
PB82-144510 1101
PB82-144536 1093
PB82-144544 1216
PB82-144551 1217
PB82-144569 1184
National League of Cities, Washington, DC.
PB82-144502 1101
HUD-H-5105
Systems Management Associates, Inc., Virginia Beach, VA.
PB82-144619 1136
HUD-H-5115
Systems Management Associates, Inc., Virginia Beach, VA.
PB82-144379 1096
HUD-H-5124RG
Artists Foundation, Inc., Boston, MA.
PB82-144650 1116
HUD-H-5140RG
Maxwell School of Citizenship and Public Affairs, Syracuse, NY. Metropolitan Studies Program.
PB82-144957 1094
PB82-144965 1094
HUD-H-5162RG
National Training and Development Service for State and Local Government, Washington, DC.
PB82-144924 1094
HUD-H-5180
Delphi Research Associates, Washington, DC.
PB82-144437 1227
HUD-H-5186CA
Brill (William) Associates, Inc., Annapolis, MD.
PB82-145004 1111
HUD-H-5250-79
University of Southern California, Los Angeles. The Planning Inst.
PB82-144387 1115
HUD-H-5385SG
United States Conference of Mayors, Washington, DC. Inst. for Urban and Regional Economic Analysis.
PB82-144577 1217
HUD-H-5386SG
International City Management Association, Washington, DC.
PB82-144981 1094
HUD-H-5388SG
National Association of Counties, Washington, DC.
PB82-144593 1217
HUD-H-5389SG
Joint Center for Political Studies, Washington, DC.
PB82-144973 1094
HUD-H-5390SG
Municipal Finance Officers Association of United States and Canada, Washington, DC. Government Finance Research Center.
PB82-144585 1093
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Skelly and Loy, Harrisburg, PA.
PB82-136995 1167
MA-RD-7-38010
C-E Marine Power Systems, Windsor, CT.
PB82-132614 1202
MDA903-77-C-0370
Logistics Management Inst., Washington, DC.
AD-A107 142/2 1230
MDA903-78-C-0029
RAND Corp., Santa Monica, CA.
AD-A107 139/8 1236
MDA903-78-C-2030
Science Applications, Inc., McLean, VA.
AD-A107 423/6 1108
AD-A107 424/4 1108
MDA903-79-C-0018
Institute for Defense Analyses, Arlington, VA. Science and Technology Div.
AD-A106 869/1 1097
AD-A107 489/7 1097
MDA903-79-C-0320
Institute for Defense Analyses, Arlington, VA. Program Analysis Div.
AD-A106 949/1 1224
MDA903-79-C-0549
RAND Corp., Santa Monica, CA.
AD-A107 345/1 1112
MDA903-80-C-0339
BDM Corp., Albuquerque, NM.
AD-A107 164/6 1256
MDA903-80-C-0591
Booz-Allen and Hamilton, Inc., Bethesda, MD.
AD-A107 496/2 1090
MDA903-80-C-0721
Calculon Corp., Rockville, MD.
AD-A107 079/6 1094
MDA903-80-D-0668
CACI, Inc.-Federal, Arlington, VA.
AD-A107 076/2 1232
MDA903-81-C-0166
Logistics Management Inst., Washington, DC.
AD-A107 141/4 1230
AD-A107 279/2 1231
MDA903-81-C-0375
Meridian Corp., Falls Church, VA.
AD-A107 402/0 1090
N00C014-75-C-0441
Florida Univ., Gainesville.
PB82-131210 1112

N01-AI-9-2622
Johns Hopkins Univ., Baltimore, MD. School of Hygiene and Public Health.
PB82-115932 1131

N01-AM-9-2221
Washington Univ., St. Louis, MO. School of Medicine.
PB82-137860 1134

N01-DE-7-2411
Applied Management Sciences, Inc., Silver Spring, MD.
PB82-135203 1132

N01-HR-0-2907
Association of American Colleges, Washington, DC.
PB82-141326 1135

N01-HV-0-2093
Thermo Electron Corp., Waltham, MA.
PB82-129321 1142

N01-HV-52942
Kappa Systems, Inc., Arlington, VA.
PB82-107525 1130

N01-OD-3-2109
Computer Horizons, Inc., Cherry Hill, NJ.
PB82-108614 1130

N00014-70-A-0016
Hawaii Inst. of Geophysics, Honolulu.
AD-A107 025/9 1168

N00014-75-C-0173
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
AD-A107 149/7 1148
AD-A107 203/2 1149
AD-A107 207/3 1149
AD-A107 208/1 1149
AD-A107 209/9 1168
AD-A107 220/6 1168
AD-A107 221/4 1168
AD-A107 222/2 1149
AD-A107 223/0 1149
AD-A107 390/7 1168

N00014-75-C-0209
Hawaii Inst. of Geophysics, Honolulu.
AD-A107 026/7 1252
AD-A107 027/5 1157
AD-A107 028/3 1168

N00014-75-C-0267
Stanford Univ., CA. Systems Optimization Lab.
AD-A107 461/6 1199

N00014-75-C-0305
Virginia Univ., Charlottesville. Dept. of Chemistry.
AD-A107 457/4 1147

N00014-75-C-0616
Texas Univ. at Austin. Center for Cybernetic Studies.
AD-A107 007/7 1089

N00014-75-C-0666
Ohio State Univ. Research Foundation, Columbus.
AD-A107 341/0 1222

N00014-75-C-0690
Washington Univ., Seattle. Dept. of Chemistry.
AD-A107 365/9 1149

N00014-75-C-0733
University of Southern California, Los Angeles. Dept. of Management.
AD-A107 086/1 1089

N00014-75-C-0880
Massachusetts Inst. of Tech., Cambridge. Dept. of Chemistry.
AD-A106 928/5 1148

N00014-75-C-0883
Brown Univ., Providence, RI. Dept. of Chemistry.
AD-A107 333/7 1189

N00014-75-C-0951
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
AD-A107 123/2 1178
AD-A107 124/0 1177
AD-A107 125/7 1172

N00014-75-C-1183
Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.
AD-A107 140/6 1233
AD-A107 462/4 1173

N00014-76-C-0016
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
AD-A107 126/5 1082
AD-A107 127/3 1082
AD-A107 217/2 1082

N00014-76-C-0037
Michigan Technological Univ., Houghton. Dept. of Metallurgical Engineering.
AD-A107 116/6 1191
AD-A107 137/2 1191

N00014-76-C-0060
Washington Univ., Seattle. Dept. of Mechanical Engineering.
AD-A107 238/8 1262

N00014-76-C-0139
Cincinnati Univ., OH. Dept. of Mechanical and Industrial Engineering.
AD-A107 236/2 1224

N00014-76-C-0279
Brown Univ., Providence, RI. Lefschetz Center for Dynamical Systems.
AD-A107 520/9 1197

N00014-76-C-0288
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Mathematical Sciences.
AD-A107 216/4 1252

N00014-76-C-0301
New York Univ., NY. Courant Inst. of Mathematical Sciences.
AD-A107 459/0 1262

N00014-76-C-0350
Rockwell International, Thousand Oaks, CA. Science Center.
AD-A106 986/3 1077

N00014-76-C-0363
Brown Univ., Providence, RI. Div. of Engineering.
AD-A106 993/9 1253
AD-A107 210/7 1253
AD-A107 211/5 1253

N00014-76-C-0482
Westinghouse Research and Development Center, Pittsburgh, PA.
AD-A107 394/9 1245

N00014-76-C-0489
Little (Arthur D.), Inc., Cambridge, MA. Dept. of Experimental Hematology.
AD-A107 541/5 1124

N00014-76-C-0687
Stanford Univ., CA. Dept. of Computer Science.
AD-A107 328/7 1173

N00014-76-C-0838
Indiana Univ. at Bloomington. Dept. of Chemistry.
AD-A107 514/2 1150

N00014-76-C-0875
California Univ., Los Angeles. Dept. of System Science.
AD-A106 905/3 1178
AD-A106 906/1 1233

N00014-76-C-0929
Stanford Univ., CA.
AD-A106 908/7 1178
AD-A106 910/3 1233
Stanford Univ., CA. Information Systems Lab.
AD-A106 909/5 1178

N00014-76-C-1070
California Inst. of Tech., Pasadena. Seismological Lab.
AD-A107 273/5 1168

N00014-76-C-1097
Lehigh Univ., Bethlehem, PA. Dept. of Physics.
AD-A107 170/3 1252

N00014-77-C-0097
Missouri Univ.-Columbia. Tailored Testing Research Lab.
AD-A107 134/9 1111
AD-A107 135/6 1111
AD-A107 364/2 1197
AD-A107 367/5 1112

N00014-77-C-0132
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
AD-A107 064/8 1263

N00014-77-C-0311
Massachusetts Inst. of Tech., Cambridge. Dept. of Chemical Engineering.
AD-A107 069/7 1194

N00014-77-C-0336
Colorado Univ. at Boulder. Center for Research on Judgment and Policy.
AD-A107 385/7 1112

N00014-77-C-0354
North Carolina Univ. at Chapel Hill.
AD-A107 226/3 1156

N00014-77-C-0366
IBM Thomas J. Watson Research Center, Yorktown Heights, NY.
AD-A106 854/3 1148

N00014-77-C-0457
Stanford Univ., CA. Dept. of Chemistry.
AD-A107 398/0 1255

N00014-77-C-0578
California Univ., Berkeley. Electronics Research Lab.
AD-A107 466/5 1239
AD-A107 467/3 1260
AD-A107 468/1 1260

N00014-77-C-0661
Desmatics, Inc., State College, PA.
AD-A107 282/6 1225

N00014-78-C-0124
Colorado State Univ., Fort Collins.
AD-A107 120/8 1263
AD-A107 121/6 1263
Colorado State Univ., Fort Collins. Dept. of Electrical Engineering.
AD-A106 911/1 1262

N00014-78-C-0433
Colorado Univ. at Boulder. Inst. of Cognitive Science.
AD-A107 502/7 1112

N00014-78-C-0565
Northwestern Univ., Evanston, IL. Dept. of Materials Science.
AD-A106 946/7 1191

N00014-78-C-0583
Mississippi Univ., University. Dept. of Physics and Astronomy.
AD-A107 495/4 1149

N00014-78-C-0609
University of Southern California, Los Angeles. Center for Effective Organizations.
AD-A106 866/7 1094

N00014-78-C-0633
Wisconsin Univ.-Madison. Dept. of Chemistry.
AD-A107 544/9 1150

N00014-78-C-0831
Northrop Research and Technology Center, Palos Verdes Peninsula, CA.
AD-A107 073/9 1255

N00014-78-C-0836
Massachusetts Univ., Amherst. Dept. of Mechanical Engineering.
AD-A107 245/3 1189

N00014-79-C-0004
Oregon State Univ., Corvallis. School of Oceanography.
AD-A107 104/2 1172

N00014-79-C-0172
Minnesota Univ., Minneapolis. Computerized Adaptive Testing Lab.
AD-A106 867/5 1106

N00014-79-C-0424
Illinois Univ. at Urbana-Champaign. Coordinated Science Lab.
AD-A106 855/0 1262

N00014-79-C-0441
Maine Univ., Orono. Dept. of Physics.
AD-A107 332/9 1252

N00014-79-C-0519
United States International Univ., San Diego, CA. Family Research Center.
AD-A107 347/7 1112
AD-A107 348/5 1113
AD-A107 349/3 1113

N00014-79-C-0525
SRI International, Menlo Park, CA.
AD-A107 498/8 1147

N00014-79-C-0553
Texas Univ. at Austin. Dept. of Electrical Engineering.
AD-A107 024/2 1170

N00014-79-C-0574
Purdue Univ., Lafayette, IN. School of Electrical Engineering.
AD-A107 383/2 1238

N00014-79-C-0575
Texas Univ. Health Science Center at Dallas. Dept. of Physiology.
AD-A107 021/8 1143
AD-A107 023/4 1143

N00014-79-C-0623
Carnegie-Mellon Univ., Pittsburgh, PA. Dept. of Mechanical Engineering.
AD-A107 363/4 1200

N00014-79-C-0629
Massachusetts Univ., Amherst. Dept. of Mathematics and Statistics.
AD-A107 109/1 1196
AD-A107 110/9 1172
AD-A107 111/7 1196

N00014-79-C-0648
California Univ., Irvine. Dept. of Chemistry.
AD-A106 963/2 1148
AD-A107 067/1 1148
AD-A107 068/9 1148

CONTRACT/GRANT NUMBER INDEX

N00014-79-C-0679
Colorado Univ. at Boulder.
AD-A107 362/6 1112

N00014-79-C-0762
Pennsylvania State Univ., University Park. Dept. of Mechanical Engineering.
AD-A107 147/1 1271

N00014-79-C-0908
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
AD-A107 128/1 1222

N00014-79-C-0991
Pennsylvania Univ., Philadelphia.
AD-A107 526/2 1150

N00014-80-C-0080
Wisconsin Univ.-Madison. Dept. of Entomology.
AD-A107 458/2 1136

N00014-80-C-0243
Georgia Inst. of Tech., Atlanta. School of Physics.
AD-A107 129/9 1148

N00014-80-C-0296
SRI International, Menlo Park, CA.
AD-A107 219/8 1122

N00014-80-C-0305
Howard Univ., Washington, DC. Dept. of Chemistry.
AD-A106 936/4 1148

N00014-80-C-0372
New York State Coll. of Agriculture and Life Sciences, Ithaca. Dept. of Education.
AD-A107 030/9 1107

N00014-80-C-0391
Varian Associates, Inc., Palo Alto, CA. Solid State Lab.
AD-A107 526/6 1171

N00014-80-C-0407
Illinois Univ. at Urbana-Champaign. Dept. of Psychology.
AD-A107 460/8 1113

N00014-80-C-0445
Westinghouse Research and Development Center, Pittsburgh, PA.
AD-A107 395/6 1252

N00014-80-C-0472
Rochester Univ., NY. Dept. of Chemistry.
AD-A107 246/1 1149

N00014-80-C-0490
Texas Univ. at Austin. Applied Research Labs.
AD-A107 169/5 1252

N00014-80-C-0491
Pennsylvania State Univ., University Park. Dept. of Chemistry.
AD-A107 474/9 1149

N00014-80-C-0505
Massachusetts Inst. of Tech., Cambridge. Artificial Intelligence Lab.
AD-A107 463/2 1173

N00014-80-C-0520
Harvard-MIT Div. of Health Sciences and Technology, Cambridge, MA.
AD-A106 978/0 1142

N00014-80-C-0566
General Electric Corporate Research and Development, Schanectady, NY.
AD-A107 392/3 1171

N00014-80-C-0779
IBM Research Lab., San Jose, CA.
AD-A107 165/3 1195
AD-A107 166/1 1195
AD-A107 167/9 1149

N00014-80-C-0821
Global Marine Development, Inc., Newport Beach, CA.
AD-A106 991/3 1168

N00014-80-C-0873
Aeronautical Research Associates of Princeton, Inc., NJ.
AD-A107 523/3 1238

N00014-80-C-0941
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
AD-A107 227/1 1255
AD-A107 301/4 1256

N00014-81-C-0519
Calspan Advanced Technology Center, Buffalo, NY.
AD-A107 308/9 1084

N00014-81-C-2376
Kigre, Inc., Toledo, OH.
AD-A107 503/5 1255
AD-A107 527/4 1255

N00014-81-K-0011
California Univ., Los Angeles. Dept. of Materials Science and Engineering.
AD-A107 228/9 1228

N00014-81-K-0014
Illinois Univ. at Urbana-Champaign. Coordinated Science Lab.
AD-A106 983/0 1196

N00014-81-K-0048
University of Southern California, Los Angeles. Center for Effective Organizations.
AD-A106 865/9 1105
AD-A106 866/7 1094

N00014-81-K-0301
Maryland Univ., College Park. Coll. of Business and Management.
AD-A106 931/9 1196

N00014-81-K-0503
Carnegie-Mellon Univ., Pittsburgh, PA. Robotics Inst.
AD-A107 281/8 1233

N00014-81-K-0648
Massachusetts Univ., Amherst.
AD-A107 274/3 1195
Massachusetts Univ., Amherst. Dept. of Polymer Science and Engineering.
AD-A107 122/4 1195
Pennsylvania Univ., Philadelphia.
AD-A106 964/0 1148
AD-A106 965/7 1194
AD-A106 966/5 1263

N00019-80-C-0331
United Technologies Research Center, East Hartford, CT.
AD-A107 029/1 1264

N00019-80-C-0483
Stanford Univ., CA.
AD-A106 908/7 1178
AD-A106 910/3 1233

N00024-78-C-5384
Johns Hopkins Univ., Laurel, MD. Applied Physics Lab.
PB82-121757 1174

N00024-79-C-6043
Pennsylvania State Univ., State College. Applied Research Lab.
AD-A107 393/1 1149

N00024-81-C-5301
Johns Hopkins Univ., Laurel, MD. Applied Physics Lab.
AD-A107 537/3 1273

N00039-80-C-0032
Auburn Univ., AL. Dept. of Electrical Engineering.
AD-A107 384/0 1237

N00167-76-M-8549
Georgetown Univ., Washington, DC. Dept. of Chemistry.
AD-A107 042/4 1266

N00173-80-C-0275
United Technologies Research Center, East Hartford, CT.
AD-A107 261/0 1237

N00173-80-C-0345
Electronic Space Systems Corp., Concord, MA.
AD-A107 404/6 1238

N00228-79-C-A414
National Research Council, Washington, DC. Commission on Human Resources.
AD-A107 446/7 1251

N61339-77-C-0166
Dunlap and Associates, Inc., La Jolla, CA. Western Div.
AD-A107 002/8 1107

N61339-78-C-0136
Dunlap and Associates, Inc., La Jolla, CA. Western Div.
AD-A107 003/6 1107
AD-A107 342/8 1108

N61339-78-C-0162
Logicon, Inc., San Diego, CA. Tactical and Training Systems Div.
AD-A106 999/6 1106
AD-A107 000/2 1106
AD-A107 001/0 1106

N62269-79-C-0209
Materials Sciences Corp., Blue Bell, PA.
AD-A107 391/5 1190

N62271-80-M-2504
Exotech Pty Ltd., Monterey, CA.
AD-A107 445/9 1270

NAG1-67
Michigan Univ., Ann Arbor.
N82-11723/5 1085

NAG1-68
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Electrical Engineering.
N82-11121/2 1191

NAG1-171
Rensselaer Polytechnic Inst., Troy, NY.
N82-11099/0 1272

NAG3-71
Kansas Univ./Center for Research, Inc., Lawrence.
N82-11052/9 1078

NAG3-175
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Electrical Computer and Systems Engineering.
N82-11959/5 1171

NAG5-75
District of Columbia Univ., Washington.
N82-12010/6 1082

NAG5-150
Smithsonian Astrophysical Observatory, Cambridge, MA.
N82-11696/3 1157

NAGW-100
Smithsonian Astrophysical Observatory, Cambridge, MA.
N82-12004/9 1082

NAS1-14996
Perkin-Elmer Corp., Danbury, CT.
N82-11453/9 1255

NAS1-15593
Analytical Mechanics Associates, Inc., Hampton, VA.
N82-11070/1 1078

NAS1-15721
Bionetics Corp., Hampton, VA.
N82-11858/9 1252

NAS1-15730
United Technologies Research Center, East Hartford, CT.
N82-11859/7 1078

NAS1-15848
TRW Defense and Space Systems Group, Redondo Beach, CA. Mechanical Engineering Lab.
N82-11116/2 1190

NAS1-15962
RCA Labs., Princeton, NJ.
N82-11452/1 1255

NAS1-16052
SRI International, Menlo Park, CA.
N82-11688/0 1085

NAS1-16380
OAO Corp., Hampton, VA.
N82-11515/5 1228

NAS2-9885
Boeing Aerospace Co., Houston, TX.
N82-11991/8 1209
N82-11992/6 1209

NAS3-20630
Pratt and Whitney Aircraft Group, East Hartford, CT.
N82-11467/9 1270

NAS3-21276
Spire Corp., Bedford, MA.
N82-11546/0 1186

NAS3-21356
Rockwell International, Canoga Park, CA. Rocketdyne Div.
N82-11468/7 1225

NAS3-21952
Boeing Aerospace Co., Seattle, WA.
N82-11110/5 1271
N82-11111/3 1271

NAS3-21977
Lockheed-California Co., Burbank.
N82-11224/4 1268

NAS3-22129
Flow Research Co., Kent, WA.
N82-11041/2 1270

NAS3-22149
Teledyne Continental Motors, Muskegon, MI. General Products Div.
N82-11068/5 1271

NAS3-22274
SHD Associates, Inc., Evanston, IL.
N82-11390/3 1262

NAS3-22480
Rockwell International, Canoga Park, CA. Rocketdyne Div.
N82-11465/3 1225

NAS5-20064
California Univ., Los Angeles. Inst. of Geophysics and Planetary Physics.
N82-11105/5 1228

NAS5-20825
Westinghouse Electric Corp., Linthicum Heights, MD.
N82-11101/4 1272

NAS5-20900
Ball Aerospace Systems Div., Boulder, CO.
N82-11511/4 1228

NAS5-23274
National Bureau of Standards, Washington, DC.
PB82-133885 1083

NAS5-24391
Computer Sciences Corp., El Segundo, CA.
N82-11103/0 1174

NAS5-25527
Environmental Research and Technology, Inc., Concord, MA.
N82-11513/0 1170

NAS5-25781
Research and Data Systems, Inc., Lanham, MD.
N82-11512/2 1085

NAS5-25786
Research and Data Systems, Inc., Lanham, MD.
N82-11800/1 1174

NAS5-25870
Environmental Research and Technology, Inc., Concord, MA.
N82-11690/6 1085

NAS5-25993
Systems and Applied Sciences Corp., Riverdale, MD.
N82-11338/2 1264

NAS5-26430
Goodyear Aerospace Corp., Akron, OH.
N82-11801/9 1174

NAS7-100
California Inst. of Tech., Pasadena.
N82-11341/6 1234

Jet Propulsion Lab., Pasadena, CA.
N82-11095/8 1272
N82-11146/9 1147
N82-11209/5 1189
N82-11279/8 1234
N82-11435/6 1228
N82-11514/8 1104
N82-11516/3 1166
N82-11548/6 1187
N82-11549/4 1182
N82-11550/2 1182
N82-11994/2 1271
N82-12015/5 1083

National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office.
PAT-APPL-6-284 286 1183
PAT-APPL-6-284 287 1238
PAT-APPL-6-284 289 1201

NAS-7-100-955909
Westinghouse Electric Corp., Pittsburgh, PA. Advanced Energy Systems Div.
DE82000093 1186

NAS8-30890
Kaiser Aluminum and Chemical Corp., Pleasanton, CA. Center for Technology.
N82-11181/6 1192

NAS8-32643
Teledyne Brown Engineering, Huntsville, AL. Engineering Services Div.
N82-11544/5 1186

NAS8-32920
Athens Coll., AL.
N82-11094/1 1222

NAS8-32994
Massachusetts Inst. of Tech., Cambridge. Dept. of Materials Science and Engineering.
N82-11958/7 1253

NAS8-33100
Intergraph Corp., Huntsville, AL.
N82-11862/1 1228

NAS8-33388
IIT Research Inst., Chicago, IL.
N82-11207/9 1256

NAS8-33816
Northrop Services, Inc., Huntsville, AL.
N82-11040/4 1272

NAS8-33847
Boeing Aerospace Co., Seattle, WA.
N82-11889/4 1245

NAS8-33980
Texas Univ. at Arlington. Center for Aeronautical Research.
N82-11490/1 1262

NAS9-14565
Environmental Research Inst. of Michigan, Ann Arbor.
N81-29504/0 1080

NAS9-14589
Texas A and M Univ., College Station. Dept. of Mathematics.
N81-29495/1 1156

NAS9-15476
Environmental Research Inst. of Michigan, Ann Arbor.
N81-29504/0 1080

NAS9-15683
Lockheed Engineering and Management Services Co., Inc., Houston, TX.
N81-29502/4 1198

NAS9-15800
Lockheed Engineering and Management Services Co., Inc., Houston, TX.
N81-29494/4 1169
N81-29497/7 1080
N81-29498/5 1198
N81-29501/6 1174
N81-29507/3 1170
N81-29508/1 1081
N81-29509/9 1174
N81-29510/7 1198

NAS9-15981
Elogic, Inc., Houston, TX.
N81-29503/2 1080

NASA-C-32369-C
National Bureau of Standards, Boulder, CO. National Engineering Lab.
PB82-140609 1229

NASA ORDER L-72497-A
Myers (Raymond H.), Blacksburg, VA.
N82-11833/2 1198
N82-11834/0 1198

NASW-3198
National Aeronautics and Space Administration, Washington, DC.
N82-11097/4 1272
N82-11223/6 1268
N82-11759/9 1144
N82-12016/3 1085

NASW-3199
National Aeronautics and Space Administration, Washington, DC.
N82-11119/6 1191
N82-11120/4 1189
N82-11225/1 1269
N82-11771/4 1144

NASW-3328
JAYCOR, Woburn, MA.
N82-11492/7 1158

NASW-3389
Lunar and Planetary Inst., Houston, TX.
N82-11691/4 1158

NASW-3541
National Aeronautics and Space Administration, Washington, DC.
N82-11697/1 1085
N82-11725/0 1087
N82-11757/3 1144
N82-11758/1 1121
N82-11989/2 1103

NASW-3542
National Aeronautics and Space Administration, Washington, DC.
N82-11636/9 1112
N82-11760/7 1144

NB79-SBCA-0079
Wyle Labs., Huntsville, AL.
PB82-130063 1229

NB79-SBCA-0088
Computer Corp. of America, Cambridge, MA.
PB82-136748 1176
PB82-136755 1176
PB82-136763 1176

NB79-SBCA-0168
Florida Univ., Gainesville. Dept. of Electrical Engineering.
PB82-135864 1263

NB79-SBCA-0273
SoHaR, Inc., Los Angeles, CA.
PB82-133521 1175

NBS-78-3534
Mueller Associates, Inc., Baltimore, MD.
PB82-130139 1202

NCC2-15
Stanford Univ., CA. Thermosciences Div.
N82-11393/7 1254
N82-11394/5 1254
N82-11395/2 1254
N82-11396/0 1254

NCS-1A-78-75
Army Engineer Waterways Experiment Station, Vicksburg, MS. Structures Lab.
AD-A107 337/8 1205

NGL-06-003-057
National Bureau of Standards, Washington, DC.
PB82-133869 1083

NGL-39-009-007
Pennsylvania State Univ., University Park. Dept. of Aerospace Engineering.
N82-11031/3 1270

NGR-2-15
Stanford Univ., CA. Thermosciences Div.
N82-11395/2 1254

NGR-05-003-553
California Univ., Berkeley.
N82-12020/5 1083

NPS-CX-8100-0-0008
Nevada Univ., Las Vegas. Archaeological Research Center.
PB82-109364 1104

NSF-APR75-13074
SRI International, Menlo Park, CA.
PB82-133075 1222

NSF-APR76-04827
Harvard Univ., Cambridge, MA. Program on Information Resources Policy.
PB82-128984 1234
PB82-128992 1234
PB82-129008 1234
PB82-129016 1235
PB82-129024 1235
PB82-129032 1235
PB82-129040 1235

NSF-ATM77-26094
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
AD-A107 199/2 1086

NSF-ATM78-19958
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
AD-A107 217/2 1082

NSF-CME78-22127
Brown Univ., Providence, RI. Div. of Engineering.
AD-A107 210/7 1253

NSF-DAR79-09489
Arizona Univ., Tucson. Div. of Economic and Business Research.
PB82-133497 1099
PB82-133505 1099

NSF-DMR80-1652
State Univ. of New York at Stony Brook.
AD-A107 153/9 1195

NSF-DPP76-81240
Lamont-Doherty Geological Observatory, Palisades, NY.
PB82-140195 1168

NSF-DPP77-26407
Rice Univ., Houston, TX.
PB82-132127 1158
PB82-132879 1159

NSF-DPP78-24832
Lamont-Doherty Geological Observatory, Palisades, NY.
PB82-140195 1168

NSF-DPP79-08242
Rice Univ., Houston, TX.
PB82-132127 1158
PB82-132879 1159

NSF-DPP79-20112
Maine Univ. at Orono.
PB82-134503 1159

NSF-DSI75-14876
Council on Library Resources, Inc., Washington, DC.
PB82-134529 1096

NSF-DSI77-16578
Lehigh Univ., Bethlehem, PA.
PB82-130386 1114

NSF-DSI77-19588
Council on Library Resources, Inc., Washington, DC.
PB82-134529 1096

NSF-DSI78-09169
Electronic Industries Association, Washington, DC.
PB82-134735 1176

NSF-ECS79-22091
Harvard-MIT Div. of Health Sciences and Technology, Cambridge, MA.
AD-A106 978/0 1142

NSF-ENG73-08214
California Univ., Berkeley.
AD-A107 275/0 1197

NSF-ENG74-19788
Hawaii Univ. at Manoa, Honolulu. Dept. of Electrical Engineering.
PB82-132804 1178

NSF-ENG76-08994
Rochester Univ., NY. Inst. of Optics.
PB82-131996 1256

NSF-ENG76-24585
Brown Univ., Providence, RI. Div. of Engineering.
AD-A106 993/9 1253

NSF-ENG78-08526
Stanford Univ., CA. Information Systems Lab.

CONTRACT/GRANT NUMBER INDEX

AD-A106 909/5 1178

NSF ENG-76-17619
Stanford Univ., CA. Thermosciences Div.
N82-11394/5 1254

NSF-ENG78-27637
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Mechanical Engineering, Aeronautical Engineering and Mechanics.
AD-A107 014/3 1170

NSF-ENV76-05682
Colorado Univ. at Boulder. Natural Hazards Research and Applications Information Center.
PB82-132663 1114

NSF-GA40532
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
AD-A107 209/9 1168

NSF-ISP78-01818
International City Management Association, Washington, DC.
PB82-138322 1093

NSF-ISP78-20518
National Governor's Association, Washington, DC.
PB82-125907 1091

NSF-ISP80-14048
Arkansas Univ. at Little Rock. Industrial Research and Extension Center.
PB82-132168 1092

NSF-IST78-12801
Florida Univ., Gainesville.
PB82-131210 1112

NSF-MCS80-10707
Massachusetts Inst. of Tech., Cambridge. Lab. for Computer Science.
AD-A107 430/1 1197

NSF-ME78-22127
Brown Univ., Providence, RI. Div. of Engineering.
AD-A107 211/5 1253

NSF-OCE73-0035
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
AD-A107 203/2 1149

NSF-OCE73-00351
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
AD-A107 207/3 1149
AD-A107 221/4 1168
AD-A107 223/0 1149
AD-A107 390/7 1168

NSF-OCE75-04890
Texas A and M Univ., College Station. Dept. of Biology.
AD-A107 022/6 1155

NSF-OCE77-19403
Woods Hole Oceanographic Institution, MA.
PB82-139411 1156

NSF-OCE77-25682
North Carolina Univ. at Chapel Hill.
AD-A107 226/3 1156

NSF-OCE77-26842
Woods Hole Oceanographic Institution, MA.
PB82-139403 1159

NSF-OCE77-28546
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
AD-A107 149/7 1148
AD-A107 208/1 1149
AD-A107 220/6 1168
AD-A107 222/2 1149

NSF-OCE80-24930
Woods Hole Oceanographic Institution, MA.
PB82-139403 1159

NSF-PFR79-06296
Purdue Univ., Lafayette, IN. School of Civil Engineering.
PB82-131772 1198

NSF-PFR79-18267
California Univ., Berkeley. Earthquake Engineering Research Center.
PB82-139940 1216

NSF-PRA78-25029
Indiana Univ. Northwest, Gary. Div. of Public and Environmental Affairs.
PB82-128620 1091
PB82-128638 1091

NSF-PRA79-10020
Portland State Univ., OR. Futures Research Inst.
PB82-128604 1091
PB82-128612 1091

NSF-PRF79-06296
Purdue Univ., Lafayette, IN. School of Electrical Engineering.
AD-A107 383/2 1238

NSG-1320
Howard Univ., Washington, DC.
N82-11493/5 1273

NSG-1377
North Carolina State Univ. at Raleigh. Center for Sound and Vibration.
N82-11039/6 1076

NSG-1414
Howard Univ., Washington, DC. Dept. of Mechanical Engineering.
N82-11100/6 1272

NSG-2142
Massachusetts Inst. of Tech., Cambridge. Dept. of Aeronautics and Astronautics.
N82-11071/9 1078

NSG-2182
Polytechnic Inst. of New York, Brooklyn.
N82-11208/7 1195

NSG-5295
Howard Univ., Washington, DC. Dept. of Mathematics.
N82-11724/3 1087

NSG-5335
Kansas Univ./Center for Research, Inc., Lawrence.
N82-11510/6 1169

NSG-7159
Texas Univ. at Arlington. Inst. for Geophysics.
N82-11695/5 1169

NSG-7360
Oregon Univ., Eugene.
N82-11698/9 1228

NSG-7610
California Inst. of Tech., Pasadena.
N82-11694/8 1158

NSG-9059
Clarkson Coll. of Technology, Potsdam, NY.
AD-A107 331/1 1173

PHS-ADM-281-78-0020
Response Analysis Corp., Princeton, NJ.
PB82-135278 1099
PB82-135286 1099
PB82-138579 1100

PHS-FD-0824
Texas Univ. Health Science Center at Dallas. Dept. of Physiology.
AD-A107 021/8 1143

PHS-GK-40034
Northwestern Univ., Evanston, IL.
PB82-106816 1130

PHS-GM-19698
Connecticut Univ. Health Center, Farmington.
AD-A107 012/7 1141

PHS-HRA-232-80-0050
National League for Nursing, Inc., New York. Div. of Research.
HRP-0903691/4 1124
HRP-0903692/2 1124
HRP-0903693/0 1124
HRP-0903694/8 1124
HRP-0903695/5 1125
HRP-0903696/3 1125
HRP-0903697/1 1125
HRP-0903698/9 1125
HRP-0903699/7 1125
HRP-0903700/3 1125
HRP-0903701/1 1125
HRP-0903703/7 1125
HRP-0903704/5 1126
HRP-0903705/2 1126
HRP-0903706/0 1126
HRP-0903707/8 1126
HRP-0903708/6 1126
HRP-0903709/4 1126
HRP-0903710/2 1126
HRP-0903711/0 1126
HRP-0903712/8 1127
HRP-0903713/6 1127
HRP-0903714/4 1127
HRP-0903715/1 1127
HRP-0903716/9 1127
HRP-0903717/7 1127
HRP-0903718/5 1127
HRP-0903719/3 1127
HRP-0903720/1 1127
HRP-0903721/9 1128
HRP-0903722/7 1128
HRP-0903723/5 1128
HRP-0903724/3 1128
HRP-0903725/0 1128
HRP-0903726/8 1128
HRP-0903727/6 1128

PHS-HRA-238-78-2128
Maine Dept. of Human Services, Augusta. Bureau of Health Planning and Development.
HRP-0903730/0 1113

PHS-HS-00786
Northwestern Univ., Evanston, IL.
PB82-106816 1130

PHS-HS-04153
American Institutes for Research, Palo Alto, CA.
PB82-133737 1110

PHS-HS-805263
Washington Univ., Seattle. Dept. of Atmospheric Sciences.
PB82-132564 1087

PHS-HSM-278-76-0062
Management Sciences for Health, Inc., Boston, MA.
PB82-110214 1130
PB82-110222 1131
PB82-110230 1131

PHS-MH-26058
MITRE Corp., McLean, VA. METREK Div.
PB82-139569 1110
PB82-139577 1110
PB82-139585 1111

PHS-NIOSH-210-76-0120
SRI International, Menlo Park, CA.
PB82-107103 1139
PB82-107194 1139

PHS-R01-MH-27830
Washington Univ., Seattle.
PB82-133380 1114

PHS-R01-MH-28960
Scientific Analysis Corp., San Francisco, CA.
PB82-134537 1096

PHS-R01-MH-29025
Cedars-Sinai Medical Center, Los Angeles, CA.
PB82-134511 1132

PHS-R01-MH-30702
North Carolina Univ. at Charlotte.
PB82-133778 1112

PHS-232-80-0050
National League for Nursing, Inc., New York. Div. of Research.
HRP-0903770/6 1129
HRP-0903771/4 1129
HRP-0903772/2 1129
HRP-0903773/0 1129
HRP-0903774/8 1130
HRP-0903775/5 1130
HRP-0903776/3 1130
HRP-0903777/1 1130
HRP-0903778/9 1130

PHS-233-79-3000
Little (Arthur D.), Inc., Cambridge, MA.
PB82-134073 1096

PHS-233-79-3011
Young (Arthur) and Co., Washington, DC.
PB82-141821 1100
PB82-141839 1100
PB82-141847 1141

PNRC-10890602
Forest Policy Project, Vancouver, WA.
PB82-107509 1081
PB82-108085 1081
PB82-109125 1082

PROJ. AGRISTARS
Elogic, Inc., Houston, TX.
N81-29503/2 1080
Lockheed Engineering and Management Services Co., Inc., Houston, TX.
N81-29494/4 1169
N81-29497/7 1080
N81-29498/5 1198
N81-29501/6 1174
N81-29502/4 1198
N81-29507/3 1170
N81-29508/1 1081
N81-29510/7 1198

N81-29511/5 1081
National Aeronautics and Space Administration, Bay Saint Louis, MS. Earth Resources Lab.
N81-29496/9 1080
National Oceanic and Atomospheric Administration, Houston, TX.
N81-29505/7 1081
N81-29506/5 1272
Science and Education Administration, Phoenix, AZ. Water Conservation Lab.
N81-29500/8 1169
Texas A and M Univ., College Station. Dept. of Mathematics.
N81-29495/1 1156
Virginia Polytechnic Inst. and State Univ., Blacksburg.
N81-29499/3 1081
R01-MH-28996
Family Hospital and Nursing Home, Milwaukee, WI.
PB82-133398 1132
SRS-18-97959
American Public Welfare Association, Washington, DC.
PB82-133711 1132
SSA-600-76-0168
SRI International, Menlo Park, CA.
PB82-136144 1133
PB82-136151 1133
PB82-136169 1133
PB82-136177 1133
PB82-136185 1133
PB82-136193 1134
W-31-109-ENG-38
Argonne National Lab., IL.
ANL/BIM-79-1 1144
DE82000098 1267
DE82000104 1267
DE82000149 1181
DE82000154 1136
DE82000170 1103
EPRI-NP-1000(V.3) 1247
Department of Energy, Washington, DC. Div. of Environmental Control Technology.
DOE/EV-0046(V.2) 1244
W-7405-ENG-26
Chem Systems, Inc., New York.
ORNL/Sub-7384/1 1209
Gilbert/Commonwealth, Jackson, MI.
ORNL/SUB-79/13837/1 1245
Honeywell, Inc., Minneapolis, MN. Energy Resources Center.
ORNL/Sub-7470/1-V3 1183
Massachusetts Inst. of Tech., Oak Ridge, TN. School of Chemical Engineering Practice.
ORNL-MIT-213 1265
Oak Ridge National Lab., TN.
DE81000502 1095
DE81030636 1239
DE81030695 1247
DE81030702 1247
DE81030813 1141
DE81032000 1209
DE81032002 1221
DE81032003 1239
DE81032005 1192
DE81032008 1239
DE81032037 1258
DE82000097 1145
DE82000136 1143
DE82000147 1197
DE82000148 1263
DE82000158 1192
DE82000441 1230
DE82000503 1239
DE82000505 1268
DE82000522 1244
NUREG/CR-2182-V1 1248
ORNL/CON-43 1201
ORNL/CON-53 1182
ORNL/OIAPA-13 1245
ORNL/TM-6253 1270
ORNL/TM-6264 1249
ORNL/TM-6428 1090
ORNL/TM-6626/V1 1187
ORNL/TM-6970 1190
ORNL/TM-6977 1183
ORNL/TM-7003 1187
ORNL/TM-7232 1193
ORNL/TM-7297 1183
ORNL/TM-7360 1240
ORNL/TM-7405 1152
ORNL-5398(Exec.Sum.) 1248
ORNL-5616 1193
ORNL-5629 1138
Oak Ridge Y-12 Plant, TN.
DE82000233 1151
Stone and Webster Engineering Corp., New York.
ORNL/SUB-7317/1 1187
ORNL/SUB-7317/2 1187
Variflex Corp., Washington, DC.
ORNL/Sub-79/45740/1 1183
Westinghouse Electric Corp., Pittsburgh, PA. Fusion Power Systems Dept.
ORNL/TM-7049 1240
Westinghouse Electric Corp., Pittsburgh, PA. Nuclear Energy Systems Div.
ORNL/SUB-7494/3 1248
W-7405-ENG-36
Aluminum Co. of America, Pittsburgh, PA.
LA-7885-MS(V.3) 1188
Fenix and Scisson, Inc., Tulsa, OK.
LA-7885-MS(V.5) 1188
Grace, Sursen, Moore and Associates, Amarillo, TX.
LA-UR-80-2086 1165
Los Alamos National Lab., NM.
DE81025366 1087
DE81028744 1087
DE81030134 1150
DE81030236 1267
Los Alamos Scientific Lab., NM.
LA-UR-79-2059 1256
LA-UR-79-2890 1259
LA-UR-80-551 1165
LA-UR-80-585 1228
LA-UR-80-621 1224
LA-UR-80-635(Rev.) 1151
LA-UR-80-716 1247
LA-UR-80-738 1261
LA-UR-80-741 1248
LA-UR-80-1069 1248
LA-UR-80-1252 1190
LA-UR-80-1358 1241
LA-UR-80-1459 1247
LA-UR-80-1486 1165
LA-UR-80-1633 1271
LA-UR-80-1753 1209
LA-UR-80-1928 1151
LA-UR-80-1933 1242
LA-UR-80-2103 1165
LA-UR-80-2134 1181
LA-UR-80-2235 1259
LA-UR-80-2342 1197
LA-UR-80-2400 1268
LA-UR-80-2406 1239
LA-UR-80-2414 1240
LA-UR-80-2427 1259
LA-UR-80-2450 1259
LA-UR-80-2496 1259
LA-UR-80-2499 1239
LA-UR-80-2500 1239
LA-7170-MS-Sup.) 1249
LA-7689-M(Ver.2.1)(Pt.1) 1181
LA-7857 1244
LA-7885-MS(V.2) 1188
LA-7885-MS(V.7) 1188
LA-7910 1263
LA-7921-PR 1244
LA-8042(V.1) 1248
LA-8042(V.3) 1249
LA-8057-PR 1249
LA-8078-MS 1173
LA-8082 1250
LA-8129-MS 1253
LA-8137-TASE 1182
LA-8179-MS 1259
LA-8215-MS 1259
LA-8217-PR 1136
LA-8283-PR 1201
LA-8286-MS 1240
LA-8298-PR 1260
LA-8349 1151
LA-8351-MS 1192
LA-8375-PR 1240
LA-8389-PR 1249
LA-8403-PR 1247
LA-8405-MS 1257
LA-8418-PR 1260
LA-8435-MS 1173
LA-8444-MS 1257
LA-8446-PR 1263
LA-8461-MS 1160
LA-8463-MS 1249
LA-8497-MS 1182
LASL-80-10(BRIEF) 1182
Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Garching (Germany, F.R.). Projektgruppe fuer Laserforschung.
LA-tr-79-46 1255
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
N82-11046/1 1254
Texas Univ. at Austin.
LA-UR-80-1943 1241
LA-UR-80-1976 1259
W-7405-ENG-48
California Univ., Berkeley.
LBL-6865 1182
LBL-10386 1228
N82-12020/5 1083
California Univ., Berkeley. Lawrence Berkeley Lab.
DE81030379 1267
DE81030544 1257
DE81030545 1150
DE82000267 1253
DE82001010 1151
LBL-8233 1151
LBL-8382 1257
LBL-8822 1226
LBL-9062 1151
LBL-9128 1241
LBL-9438 1166
LBL-9546 1158
LBL-9576 1201
LBL-9809 1209
LBL-9816 1201
LBL-9959 1098
LBL-10109 1143
LBL-10166(Rev.) 1158
LBL-10189/1 1174
LBL-10193(Rev.) 1245
LBL-10259 1192
LBL-10648 1095
LBL-10811 1174
LBL-10861 1166
LBL-10985 1166
LBL-11030 1249
LBL-11072 1209
LBL-11097 1241
LBL-11109 1192
LBL-11192 1246
LBL-11349 1097
GeoResources Associates, Napa, CA.
LBL-10540 1158
Golder Associates, Inc., Kirkland, WA.
LBL-10839 1166
Jewson Enterprises, Menlo Park, CA.
LBL-8772 1087
Lawrence Livermore National Lab., CA.
DE81000241 1239
DE81024374 1086
DE81024414 1086
DE81024417 1086
DE81024451 1087
DE81030338 1188
DE82000243 1267

CONTRACT/GRANT NUMBER INDEX

DE82000347 1161

Lick Observatory, Mount Hamilton, CA.

DE81030835 1082

Los Alamos Scientific Lab., NM.

LA-7689-M(Ver.2.1)(Pt.1) 1181

LA-8350-PR 1257

W-7405-ENG-82

Ames Lab., IA.

IS-T-847 1165

ISM-227 1201

NTIS ORDER/REPORT NUMBER INDEX

NTIS®

Entries in this index list the NTIS order number, the performing organization report number, and the sponsoring organization report number, each in its own alphanumeric position. Although reports may be ordered using only the performing organization report number or the sponsoring organization report number, please use the NTIS order number to order items available from NTIS to ensure faster service. It is best to check the full bibliographic citation in the Reports Announcements section before ordering. Entries are arranged alphanumerically.

SAMPLE ENTRY

NSF/RA-790206
Computation of Hankel Transforms Using the Fast-Fourier Transform Algorithm.
PB80-104045 93 PC **A03**/MF **A01**

PB80-104045
Computation of Hankel Transforms Using the Fast-Fourier Transform Algorithm.
PB80-104045 33 PC **A03**/MF **A01**

R79-12
Computation of Hankel Transforms Using the Fast-Fourier Transform Algorithm.
PB80-104045 33 PC **A03**/MF **A01**

Report or series number
Title
NTIS order number Page no. Price codes

Report or series number
Title
NTIS order number Page no. Price codes

Report or series number
Title
NTIS order number Page no. Price codes

1
An Appraisal of Performance Appraisal Summary Results of a Large Scale Study.
AD-A106 865/9 1105 PC **A04**/MF **A01**

1-2-11
Project Lame 80F: A Cultural Resource Survey Around Boulder Beach, Echo Bay, Temple Bar and Cottonwood Cove in the Lake Mead National Recreation Area Clark County, Nevada and Mohave County, Arizona.
PB82-109364 1104 PC **A08**/MF **A01**

1WW/TFRN/81/001
Terminal Forecast Reference Notebook, Osan AB, Korea.
AD-A107 433/5 1086 PC **A06**/MF **A01**

1WW/TFRN/81/002
Terminal Forecast Reference Notebook, Camp Casey, Korea.
AD-A107 432/7 1086 PC **A03**/MF **A01**

2
Systems Are Not Solutions: Issues in Creating Information Systems That Account for the Human Organization.
AD-A106 866/7 1094 PC **A03**/MF **A01**

5WW/TFRN-81/004
Terminal Forecast Reference Notebook, Fresno Air Terminal, California.
AD-A107 434/3 1086 PC **A05**/MF **A01**

50
Advances in Sample Introduction for Elemental Analysis.
AD-A107 514/2 1150 PC **A02**/MF **A01**

81-1
Multiple Perspective Concept with Applications to Technology Assessment and Other Decision Areas.
PB82-128604 1091 PC **A16**/MF **A01**

81-1A
The Multiple Perspective Concept with Applications to Technology Assessment and Other Decision Areas (Condensed Version),
PB82-128612 1091 PC **A05**/MF **A01**

81-5(11)
An Appraisal of Performance Appraisal Summary Results of a Large Scale Study.
AD-A106 865/9 1105 PC **A04**/MF **A01**

81-6(12)
Systems Are Not Solutions: Issues in Creating Information Systems That Account for the Human Organization.
AD-A106 866/7 1094 PC **A03**/MF **A01**

81-9F3-SIMFN-R1
Charged Particle Simulation of Fast Neutron Damage.
AD-A107 394/9 1245 PC **A04**/MF **A01**

81-9F7-BOULE-R5
Preparation of Large-Diameter GaAs Crystals.
AD-A107 395/6 1252 PC **A06**/MF **A01**

81-013
Evaluation of the Effectiveness and Efficiency of Preventive Dentistry Programs: Assessment of the Relationship between Past Dental Experience and Dental Sick Call in the Field.
AD-A107 506/8 1124 PC **A03**/MF **A01**

81-014
Characteristics of the Class of 1985,
AD-A107 100/0 1107 PC **A02**/MF **A01**

81/66C-266
TRACALS Evaluation Report. Communications Initial Evaluation Report, Hill AFB, Utah, 9-15 June 1981.
AD-A107 507/6 1237 PC **A04**/MF **A01**

81/66N-278
TRACALS Evaluation Report. Solid State Instrument Landing System AN/GRN-29(V) Initial Evaluation Report, Columbus AFB, Mississippi, 7-20 July 1981.
AD-A107 397/2 1237 PC **A05**/MF **A01**

81/66R-259
TRACALS Evaluation Report. Airport Surveillance and Precision Approach Radar AN/GPN-24(V), Initial Evaluation Report, RAF Upper Heyford, England 11 Mar-25 April 81.
AD-A107 491/3 1237 PC **A04**/MF **A01**

81/66S-275
TRACALS Evaluation Report. Airport Surveillance Radar AN/GPN-12. Special Evaluation Report. Salt lake City International Airport and Wendover Auxiliary Airfield, Utah, 3 and 6-15 June 1981.
AD-A107 234/7 1237 PC **A04**/MF **A01**

NTIS ORDER/REPORT NUMBER INDEX

81/66S-280
TRACALS Evaluation Report. VOR Special Evaluation Report, Williams AFB, Arizona, 22-27 July 1981.
AD-A107 396/4 1237 PC **A03**/MF **A01**

82/81
A Study of the (26)Mg((12)C,(12)B)(26)Al Charge Exchange Reaction,
PB82-135740 1260 PC **A02**/MF **A01**

87/81
Transverse Properties of Hadrons Produced in Neutrino-Nucleon Scattering in BEBC,
PB82-135732 1260 PC **A02**/MF **A01**

131-80-VIII
An Evaluation of Farmers Home Administration's Economic Emergency Loan Program Objectives to Determine the Programs Effectiveness and the Need for the Program.
PB82-134727 1092 PC **A07**/MF **A01**

431
Some Planning Theories (Algunos Enfoques de Planeacion),
PB82-135369 1092 PC **A05**/MF **A01**

432
Probabilistic Analysis of Seismic Response of Multi-Supported Structures on Soft Soils (Analisis Probabilistico de la Respuesta Sismica de Estructuras Sobre Varios Apoyos en Suelos Blandos),
PB82-135377 1226 PC **A03**/MF **A01**

433
Design of Concrete Walls with Shear Failure (Diseno de Muros de Concreto Con Falla Por Cortante),
PB82-135385 1226 PC **A09**/MF **A01**

434
Trusted Interval in the Fourier Spectra of Accelerograms Digitized Either Manually or by Semi-Automatic Means (Intervalo Confiable en el Espectro de Fourier Obtenido de Acelerogramas Digitizados Manualmente o Con Medios Semiautomaticos),
PB82-135393 1169 PC **A03**/MF **A01**

435
Static Penetrometer for Soft and Loose Soils (Penetrometro Estatico Para Suelos Blandos Y Sueltos),
PB82-135401 1170 PC **A03**/MF **A01**

442
Scientific Research and Basic Needs of the People: A Method of Assessing Research Projects (Investigacion Cientifica Y Necesidades Basicas de la Poblacion: Un Metodo de Evaluacion de Proyectos),
PB82-135419 1092 PC **A06**/MF **A01**

1216-00
Medicaid Nursing Home Reimbursement in Louisiana (Volume 8),
PB82-139932 1134 PC **A03**/MF **A01**

1216-1
Medicaid Nursing Home Reimbursement in Colorado (Volume 7),
PB82-139924 1134 PC **A04**/MF **A01**

1216-2
Medicaid Nursing Home Reimbursement in Connecticut (Volume 6),
PB82-139916 1134 PC **A05**/MF **A01**

1216-5
Medicaid Nursing Home Reimbursement in Minnesota (Volume 3),
PB82-139908 1134 PC **A06**/MF **A01**

2291
The Soviet View of Local Wars and Wars of National Liberation: Strategy and Concepts of Employment.
AD-A107 075/4 1231 PC **A03**/MF **A01**

4441-T(6)
Chemical Technology and Economics in Environmental Perspective. Task VI - A Survey of Plasticizers: Epoxies, Linear Polyesters, and Trimellitates.
PB82-136102 1147 PC **A04**/MF **A01**

8641-A00A
Prototype Equipment Student Guide for ACE (Air Intercept Controller Prototype Training System).
AD-A106 999/6 1106 PC **A08**/MF **A01**

8641-A004
Behavioral Objectives for Air Intercept Controller Prototype Training System.
AD-A107 001/0 1106 PC **A04**/MF **A01**

8641-A006
Ordinal Syllabus for Air Intercept Controller Prototype Training System.
AD-A107 000/2 1106 PC **A07**/MF **A01**

A-8604
A Computer Solution to the Stationary Navier-Stokes Equations in Two Dimensions with Proven Convergence.
N82-11396/6 1254 PC **A02**/MF **A01**

A-8741
A Comparison of Theoretical and Experimental Pressure Distributions for Two Advanced Fighter Wings.
N82-11054/5 1078 PC **A05**/MF **A01**

A-8746
Algorithm for Fuel Conservative Horizontal Capture Trajectories.
N82-11018/0 1076 PC **A03**/MF **A01**

AAI-78/133
Housing Deprivation Among Enrollees in the Housing Allowance Demand Experiment,
PB82-144411 1115 PC **A12**/MF **A01**

AAI-80/61
Housing Allowance Demand Experiment: Final Report,
PB82-145020 1119 PC **A14**/MF **A01**

ACS/RR-2
Ship Chartering Alternatives for Grain-Exporting Cooperatives.
PB82-130881 1098 PC **A04**/MF **A01**

ACS-SR-1
Attitudes Toward Cooperatives by Bank Trust and Professional Farm Managers,
PB82-131244 1080 PC **A02**/MF **A01**

ACS/SR-2
Financial Profile of 15 New Agricultural Marketing Cooperatives,
PB82-131202 1080 PC **A02**/MF **A01**

ACS/SR-3
Cooperative Farm Machinery Operations: Oregon and Wisconsin,
PB82-134123 1080 PC **A02**/MF **A01**

ACS/SR-5
Vacation Farm Cooperatives,
PB82-134388 1080 PC **A02**/MF **A01**

AD-A106 818/8
When the Grand Tour's a Grind,
AD-A106 818/8 1143 PC **A02**/MF **A01**

AD-A106 819/6
Effect of Work Schedule, and Description of Career Intention on Organizational Effectiveness.
AD-A106 819/6 1105 PC **A02**/MF **A01**

AD-A106 820/4
Effect of Number Supervised and Educational Level on Organizational Effectiveness.
AD-A106 820/4 1105 PC **A02**/MF **A01**

AD-A106 821/2
Simulation Testing of Weapon Systems.
AD-A106 821/2 1251 PC **A03**/MF **A01**

AD-A106 822/0
How to Make TIGER Perform: A Supplementary Operator's Manual for the TIGER Code.
AD-A106 822/0 1251 PC **A03**/MF **A01**

AD-A106 823/8
Tomographic Reconstruction of Strongly Refracting Fields and Its Application to Interferometric Measurement of Boundary Layers.
AD-A106 823/8 1229 Not available NTIS

AD-A106 824/6
Testing of RPMI-1640 as a Nutrient Medium for Fresh Semilunar Valve Storage.
AD-A106 824/6 1140 PC **A04**/MF **A01**

AD-A106 825/3
Feline Malignant Lymphoma: A Multiway Frequency Analysis of a Population Involving Sex, Age, Cell Type, and Tumor Location.
AD-A106 825/3 1122 PC **A03**/MF **A01**

AD-A106 826/1
Transportation Contingency Plans for Future Gas Shortages will not Meet Commuter Needs.
AD-A106 826/1 1179 PC **A04**/MF **A01**

AD-A106 827/9
Health and Safety Deficiencies Found at Water Recreation Areas.
AD-A106 827/9 1122 PC **A03**/MF **A01**

AD-A106 828/7
Corps of Engineers' Acquisition of Fish Hatchery Proves Costly.
AD-A106 828/7 1079 PC **A06**/MF **A01**

AD-A106 829/5
Efforts to Improve School Lunch Programs--Are They Paying Off.
AD-A106 829/5 1137 PC **A05**/MF **A01**

AD-A106 830/3
Still No Progress in Implementing Controls over Contracts and Grants with Indians.
AD-A106 830/3 1087 PC **A05**/MF **A01**

AD-A106 831/1
Controller Staffing and Training at Four FAA Air Traffic Control Facilities.
AD-A106 831/1 1105 PC **A03**/MF **A01**

AD-A106 832/9
Analysis of HUD's May 4, 1981 Response Concerning Its Efforts to Alleviate Housing Abandonment.
AD-A106 832/9 1203 PC **A02**/MF **A01**

AD-A106 833/7
Consumers Need More Reliable Automobile Fuel Economy Data.
AD-A106 833/7 1179 PC **A03**/MF **A01**

AD-A106 834/5
Federal Land Acquisition and Management Practices.
AD-A106 834/5 1203 PC **A05**/MF **A01**

AD-A106 835/2
Legislative and Regulatory Actions Needed to Deal with a Changing Domestic Telecommunications Industry.
AD-A106 835/2 1102 PC **A11**/MF **A01**

AD-A106 836/0
Review of the Navajo and Hopi Indian Relocation Commission's Program.
AD-A106 836/0 1113 PC **A02**/MF **A01**

AD-A106 837/8
Conrail Needs to Further Improve Inventory Control and Management.
AD-A106 837/8 1088 PC **A04**/MF **A01**

AD-A106 838/6
Eliminating Contractor Inspections of Federal Water Projects Could Save Millions.
AD-A106 838/6 1203 PC **A03**/MF **A01**

AD-A106 839/4
SBA's 7(j) Management Assistance Program: Changes Needed to Improve Efficiency and Effectiveness.
AD-A106 839/4 1088 PC **A04**/MF **A01**

AD-A106 840/2
SBA's Progress in Implementing the Public Law 95-507 Subcontracting and Surety Bond Waiver Provisions has been Limited.
AD-A106 840/2 1088 PC **A03**/MF **A01**

AD-A106 841/0
Grain Fumigation: A Multifaceted Issue Needing Coordinated Attention.
AD-A106 841/0 1079 PC **A02**/MF **A01**

AD-A106 842/8
Tightening Eligibility Standards Could Cut Involuntary Retirement Costs by Millions of Dollars.
AD-A106 842/8 1105 PC **A02**/MF **A01**

AD-A106 843/6
Serious Problems Need to be Corrected before Federal Merit Pay Goes into Effect.
AD-A106 843/6 1105 PC **A03**/MF **A01**

AD-A106 844/4
Recruiting Malpractice: Extent, Causes, and Potentials for Improvement.
AD-A106 844/4 1105 PC **A04**/MF **A01**

AD-A106 845/1
Veterans Administration Education Loan Program Should be Terminated: Legislative Action Taken.
AD-A106 845/1 1105 PC **A02**/MF **A01**

AD-A106 846/9
States' Efforts to Detect Duplicate Public Assistance Payments.
AD-A106 846/9 1113 PC **A02**/MF **A01**

AD-A106 847/7
Department of Labor Needs to Give CETA Prime Sponsors More Guidance and Assistance for Implementing Monitoring Requirements.
AD-A106 847/7 1105 PC **A02**/MF **A01**

AD-A106 848/5
Improvements Needed in Assessing Penalties and Controlling Penalty Collections Resulting from Occupational Safety and Health Inspections.
AD-A106 848/5 1138 PC **A02**/MF **A01**

AD-A106 849/3
Follow-Up Review to Determine the Extent to Which the Department of Health and Human Services has Implemented the Recommendations in Our Report: 'Increased Federal Efforts Needed to Better Identify, Treat, and Prevent Child Abuse and Neglect'.
AD-A106 849/3 1113 PC **A02**/MF **A01**

AD-A106 850/1
Review of Department of Transportation's Response to Recommendations in the Senate Report on the Federal Aviation Administration's En Route Air Traffic Control Computer System.
AD-A106 850/1 1236 PC **A02**/MF **A01**

AD-A106 851/9
Data on Small Business--Much is Collected but it Should be Integrated for Better Use.
AD-A106 851/9 1094 PC **A02**/MF **A01**

AD-A106 852/7
Prediction of Energy Expenditure during Load Carriage at High Altitude.
AD-A106 852/7 1143 PC **A02**/MF **A01**

AD-A106 853/5
The Health Opinion Survey: Predicting Illness in Military Trainees.
AD-A106 853/5 1122 PC **A02**/MF **A01**

AD-A106 854/3
Lifetime Broadening of Excited Pyrazine Adsorbed on Ag(111).
AD-A106 854/3 1148 PC **A02**/MF **A01**

AD-A106 855/0
Theoretical and Experimental Investigation of the Dynamics of Pulsed Laser Annealing of Amorphous Silicon.
AD-A106 855/0 1262 Not available NTIS

AD-A106 856/8
Billions of Dollars are Involved in Taxation of the Life Insurance Industry -- Some Corrections in the Law are Needed.
AD-A106 856/8 1097 PC **A11**/MF **A01**

AD-A106 857/6
Special Estate Tax Provisions for Farmers Should be Simplified to Achieve Fair Distribution of Benefits.
AD-A106 857/6 1102 PC **A05**/MF **A01**

AD-A106 858/4
Progress in Improving Program and Budget Information for Congressional Use.
AD-A106 858/4 1088 PC **A03**/MF **A01**

AD-A106 859/2
FERC Should Improve the Natural Gas Well Determination Process.
AD-A106 859/2 1265 PC **A03**/MF **A01**

AD-A106 860/0
Questions Concerning DOE's Assignment of Operating and Testing Responsibilities for OTEC-1.
AD-A106 860/0 1179 PC **A02**/MF **A01**

AD-A106 861/8
Delays in Receiving and Investing Taxes are Reducing Railroad Retirement Program Interest Income.
AD-A106 861/8 1105 PC **A02**/MF **A01**

AD-A106 862/6
National Dam Safety Program. Busch Wildlife Area Lake Number 35 Dam (MO 10092), Mississippi - Kaskaskia - St. Louis Basin, St. Charles County, Missouri. Phase I Inspection Report.
AD-A106 862/6 1203 MF **A01**

AD-A106 863/4
National Dam Safety Program. A. C. Schneider Lake Dam (MO 31563), Missouri - Kansas City River Basin, Gasconade County, Missouri. Phase I Inspection Report.
AD-A106 863/4 1203 MF **A01**

AD-A106 864/2
Installation Restoration Program Records Search for Langley Air Force Base, Virginia.
AD-A106 864/2 1203 MF **A01**

AD-A106 865/9
An Appraisal of Performance Appraisal Summary Results of a Large Scale Study.
AD-A106 865/9 1105 PC **A04**/MF **A01**

AD-A106 866/7
Systems Are Not Solutions: Issues in Creating Information Systems That Account for the Human Organization.
AD-A106 866/7 1094 PC **A03**/MF **A01**

AD-A106 867/5
A Validity Comparison of Adaptive and Conventional Strategies for Mastery Testing.
AD-A106 867/5 1106 PC **A03**/MF **A01**

AD-A106 868/3
Manufacturing Methods and Technology Project Execution Report.
AD-A106 868/3 1088 PC **A08**/MF **A01**

AD-A106 869/1
Software Technology Transfer and Export Control.
AD-A106 869/1 1097 PC **A07**/MF **A01**

AD-A106 870/9
Continental United States Over-The-Horizon-Backscatter (OTH-B) Radar System. Supplement.
AD-A106 870/9 1237 MF **A01**

AD-A106 871/7
Concerns about HHS' Ability to Effectively Implement Incentive Funding for State Information Systems in the Aid to Families with Dependent Children Program.
AD-A106 871/7 1088 PC **A02**/MF **A01**

AD-A106 872/5
Ohio's 1981 Home Energy Assistance Program.
AD-A106 872/5 1180 PC **A02**/MF **A01**

AD-A106 873/3
Injury Compensation Process Delays Prompt Payment of Benefits to Federal Workers.
AD-A106 873/3 1088 PC **A04**/MF **A01**

AD-A106 874/1
Limits on Receipt of Multiple Disability Benefits Could Save Millions.
AD-A106 874/1 1106 PC **A02**/MF **A01**

AD-A106 875/8
The Guaranteed Student Loan Information System Needs a Thorough Redesign to Account for the Expenditure of Billions.
AD-A106 875/8 1088 PC **A03**/MF **A01**

AD-A106 876/6
Medicare's Reimbursement Policies for Durable Medical Equipment Should be Modified and Made More Consistent.
AD-A106 876/6 1122 PC **A03**/MF **A01**

AD-A106 877/4
Information on Funding Commitments from Comprehensive Employment and Training Act Titles III and IV during Fiscal Year 1981.
AD-A106 877/4 1106 PC **A04**/MF **A01**

AD-A106 878/2
U.S. Laws and Regulations Applicable to Imports from Nonmarket Economies Could be Improved.
AD-A106 878/2 1097 PC **A05**/MF **A01**

AD-A106 879/0
Unresolved Issues Remain Concerning U.S. Participation in the International Energy Agency.
AD-A106 879/0 1102 PC **A07**/MF **A01**

AD-A106 880/8
Management of the Department of State Office of Passport Services Needs to be Improved.
AD-A106 880/8 1088 PC **A04**/MF **A01**

AD-A106 881/6
Industry Views on the Ability of the U.S. Photovoltaics Industry to Compete in Foreign Markets.
AD-A106 881/6 1097 PC **A09**/MF **A01**

AD-A106 882/4
Ineffective Management of the Appropriate Technology Small Grants Program.
AD-A106 882/4 1088 PC **A02**/MF **A01**

AD-A106 883/2
Unresolved Issues Resulting from Changes in DOE's Synthetic Fuels Commercialization Programs.
AD-A106 883/2 1266 PC **A02**/MF **A01**

AD-A106 884/0
Coal and Nuclear Wastes--Both Potential Contributors to Environmental and Health Problems.
AD-A106 884/0 1135 PC **A03**/MF **A01**

AD-A106 885/7
Potential Impediment of Foundry Capacity Relative to National Defense Needs.
AD-A106 885/7 1097 PC **A02**/MF **A01**

AD-A106 886/5
Improvements in Department of the Interior Leasing of Potential Aluminum Resources Are Necessary for More Timely Decisionmaking.
AD-A106 886/5 1191 PC **A02**/MF **A01**

AD-A106 887/3
The Oil Shale Corporation Loan Guarantee Contract.
AD-A106 887/3 1180 PC **A02**/MF **A01**

AD-A106 888/1
Analysis of Federal Funding for Electric Utility R&D Projects.
AD-A106 888/1 1088 PC **A02**/MF **A01**

AD-A106 889/9
Report of the President's Task Force on Aircraft Crew Complement.
AD-A106 889/9 1106 PC **A06**/MF **A01**

AD-A106 890/7
An Analytical and Experimental Analysis of Factors Affecting Exhaust System Performance in Sea Level Static Jet Engine Test Facilities.
AD-A106 890/7 1269 PC **A07**/MF **A01**

AD-A106 891/5
Inquiry into the Status of a Proposal to Construct 16 Single-Family Detached Homes for the Cuyahoga Metropolitan Housing Authority in Cleveland, Ohio.
AD-A106 891/5 1113 PC **A02**/MF **A01**

AD-A106 892/3
Storage Cost Data on CCC-Owned Dairy Commodities.
AD-A106 892/3 1137 PC **A02**/MF **A01**

AD-A106 893/1
Allegations of Unfair Bidding Requirements at Griffiss Air Force Base, Rome, New York.
AD-A106 893/1 1088 PC **A02**/MF **A01**

AD-A106 894/9
Inquiry Concerning Denial of Contracts to Low Offeror for Army Translation Services.
AD-A106 894/9 1088 PC **A02**/MF **A01**

AD-A106 895/6
HUD's Oversight of Procurement by Public Housing Authorities Needs Strengthening.
AD-A106 895/6 1089 PC **A02**/MF **A01**

AD-A106 896/4
The British Sting Ray Torpedo: Information Should be Obtained to Determine Potential Benefits to U.S. Antisubmarine Warfare Programs.
AD-A106 896/4 1252 PC **A02**/MF **A01**

AD-A106 897/2
Evaluation of the Army's Advanced Field Artillery Tactical Data System.
AD-A106 897/2 1251 PC **A02**/MF **A01**

AD-A106 898/0
Questionable Use of the C-X and Other Air Force Weapon System Funds.
AD-A106 898/0 1231 PC **A02**/MF **A01**

AD-A106 899/8
U.S. Role in Sinai Important to Mideast Peace.
AD-A106 899/8 1102 PC **A02**/MF **A01**

AD-A106 900/4
Energy-Efficient and Cost-Effective Equipment Should be Installed in New Government Housing.
AD-A106 900/4 1199 PC **A03**/MF **A01**

AD-A106 901/2
Follow-up Report on Domestic Aluminum Resources: Dilemmas of Development.
AD-A106 901/2 1191 PC **A02**/MF **A01**

AD-A106 902/0
Energy Impacted Area Development Assistance Program's Designation Criteria.
AD-A106 902/0 1180 PC **A02**/MF **A01**

AD-A106 903/8
Minerals Critical to Developing Future Energy Technologies, Their Availability, and Projected Demand.
AD-A106 903/8 1180 PC **A03**/MF **A01**

AD-A106 904/6
Burdensome and Unnecessary Reporting Requirements of the Public Utility Regulatory Policies Act Need to be Changed.
AD-A106 904/6 1180 PC **A03**/MF **A01**

AD-A106 905/3
The Use of Output Moments to Predict Performance of Nonlinear Systems with Gaussian Inputs.
AD-A106 905/3 1178 PC **A02**/MF **A01**

AD-A106 906/1
Quadratic-Exponential Moment Error Bounds for Digital Communication Systems.
AD-A106 906/1 1233 PC **A02**/MF **A01**

AD-A106 907/9
Time Dependence of Current at High Electric Fields in Al(x)Ga(1-x)As-GaAs Heterojunction Layers.
AD-A106 907/9 1262 Not available NTIS

AD-A106 908/7
The Time-Sequenced Adaptive Filter.
AD-A106 908/7 1178 Not available NTIS

AD-A106 909/5
Adaptive Design of Digital Filters.
AD-A106 909/5 1178 Not available NTIS

AD-A106 910/3
Multichannel Adaptive Filtering for Signal Enhancement.
AD-A106 910/3 1233 Not available NTIS

AD-A106 911/1
Charge Instabilities in Lateral Super-Lattices under Conditions of Population Inversion.
AD-A106 911/1 1262 PC **A02**/MF **A01**

AD-A106 912/9
Comparisons of Performance Effectiveness Among Divers.
AD-A106 912/9 1106 Not available NTIS

AD-A106 913/7
Synthesis, Radiation Degradation, and Electron Beam Resist Behavior of Fluorine-Containing Vinyl Polymers.
AD-A106 913/7 1194 Not available NTIS

AD-A106 914/5
Experience with an Expendable Temperature and Velocity Profiler.
AD-A106 914/5 1156 Not available NTIS

AD-A106 915/2
Greater Commitment Needed to Solve Continuing Problems at Three Mile Island.
AD-A106 915/2 1242 PC **A06**/MF **A01**

AD-A106 916/0
Elimination of Federal Funds for the Heber Project will Impede Full Development and Use of Hydrothermal Resources.
AD-A106 916/0 1180 PC **A02**/MF **A01**

AD-A106 917/8
Congress Should Increase Financial Protection to the Public from Accidents at DOE Nuclear Operations.
AD-A106 917/8 1242 PC **A03**/MF **A01**

AD-A106 918/6
Update of Cost Information Contained in a Previous GAO Report on Specific Aspects of the Clinch River Breeder Reactor Project.
AD-A106 918/6 1246 PC **A02**/MF **A01**

AD-A106 919/4
Options for Establishing an Energy Conservation Consolidated Grant Program.
AD-A106 919/4 1180 PC **A02**/MF **A01**

AD-A106 920/2
Synthetic Fuels Corporation's Management of Demonstration Projects Would Be Limited.
AD-A106 920/2 1266 PC **A03**/MF **A01**

AD-A106 921/0
The United States Remains Unprepared for Oil Import Disruptions. Volume I. Summary: Includes Conclusions and Recommendations.
AD-A106 921/0 1180 PC **A05**/MF **A01**

AD-A106 922/8
The United States Remains Unprepared for Oil Import Disruptions. Volume II. Detailed Review of Current Emergency Programs and Alternative Approaches.
AD-A106 922/8 1180 PC **A11**/MF **A01**

AD-A106 923/6
Status of Strategic Petroleum Reserve Activities--July 1981.
AD-A106 923/6 1266 PC **A02**/MF **A01**

AD-A106 924/4
Federal Energy Regulatory Commission Needs to Act on the Construction-Work-in-Progress Issue.
AD-A106 924/4 1180 PC **A02**/MF **A01**

AD-A106 925/1
The Debate over Acid Precipitation--Opposing Views--Status of Research.
AD-A106 925/1 1083 PC **A04**/MF **A01**

AD-A106 926/9
Wind Tunnel Test of a Self-Optimizing Flexible Technology Wing.
AD-A106 926/9 1077 PC **A02**/MF **A01**

AD-A106 927/7
Saudi Perceptions of the International Environment.
AD-A106 927/7 1102 PC **A02**/MF **A01**

AD-A106 928/5
Electrostatic Binding of Electroactive and Non-Electroactive Anions in a Surface-Confined, Electroactive Polymer: Selectivity of Binding Measured by Auger Spectroscopy and Cyclic Voltammetry.
AD-A106 928/5 1148 PC **A03**/MF **A01**

AD-A106 929/3
Water-Resources Information for the Withlacoochee River Region, West-Central Florida.
AD-A106 929/3 1159 PC **A07**/MF **A01**

AD-A106 930/1
Saudi Arabia: The Flexibility of Islamic Fundamentalism.
AD-A106 930/1 1102 PC **A02**/MF **A01**

NTIS ORDER/REPORT NUMBER INDEX

AD-A106 931/9
Developments in Discrete Distributions 1969-1980.
AD-A106 931/9 1196 PC **A02**/MF **A01**

AD-A106 932/7
Mitigation of Shore Damage Attributed to the Federal Navigation Structures at Ludington Harbor, Michigan.
AD-A106 932/7 1203 PC **A11**/MF **A01**

AD-A106 933/5
Mitigation of Shore Damage Attributed to the Federal Navigation Structures at Port Sanilac Harbor, Michigan.
AD-A106 933/5 1204 PC **A09**/MF **A01**

AD-A106 934/3
Maintenance Dredging & Confined Disposal Facility for the Crooked River Portion of Michigan's Inland Route and the Operation, Maintenance, & Proposed Public Use Facilities for the Alanson Lock and Weir, Michigan.
AD-A106 934/3 1204 PC **A09**/MF **A01**

AD-A106 935/0
Maintenance Dredging of the Federal Navigation Channels in the St. Clair River, Michigan.
AD-A106 935/0 1204 PC **A07**/MF **A01**

AD-A106 936/8
Maintenance Dredging of the Federal Navigation Channels in the Saginaw River and Saginaw Bay, Michigan.
AD-A106 936/8 1204 PC **A09**/MF **A01**

AD-A106 937/6
Theory and Applications of Optimal Control in Aerospace Systems.
AD-A106 937/6 1078 PC **A13**/MF **A01**

AD-A106 938/4
Model Analysis of the Raman Spectrum from Fused Silica Optical Fibers.
AD-A106 938/4 1148 PC **A02**/MF **A01**

AD-A106 939/2
Preparation and Design for a Training Effectiveness Evaluation of Device 2F64C for Replacement Pilot Training.
AD-A106 939/2 1106 PC **A05**/MF **A01**

AD-A106 940/0
GAO Comments on the Impact of the USDA Reorganization of Nutrition.
AD-A106 940/0 1089 PC **A02**/MF **A01**

AD-A106 941/8
Simulator Evaluation of Electronic Radio Aids to Navigation Displays, the RA-1 Experiment.
AD-A106 941/8 1236 PC **A09**/MF **A01**

AD-A106 942/6
Engineering Design Handbook. Discontinuous Fiberglass Reinforced Thermoplastics.
AD-A106 942/6 1194 PC **E15**/MF **E15**

AD-A106 943/4
Evaluation of Gamma Radiation for Destruction of Pentachlorophenol in Aqueous Solution and on Activated Carbon.
AD-A106 943/4 1154 PC **A05**/MF **A01**

AD-A106 944/2
Primary Dermal Irritation Potential of the Insect Repellent CHF1 and Its Components.
AD-A106 944/2 1144 PC **A02**/MF **A01**

AD-A106 945/9
Fathering and the Pediatric Cancer Experience.
AD-A106 945/9 1122 PC **A05**/MF **A01**

AD-A106 946/7
Thresholds for Fatigue Initiation and Propagation and Plastic Work in HY80 and HY130 Steels.
AD-A106 946/7 1191 PC **A02**/MF **A01**

AD-A106 947/5
Active RF Seeker Analysis for Land Combat Seekers.
AD-A106 947/5 1238 PC **A04**/MF **A01**

AD-A106 948/3
Signal Analysis Van Hardware Operation General Description. Volume 1.
AD-A106 948/3 1238 PC **A03**/MF **A01**

AD-A106 949/1
Planning Amphibious Lift Forces. Appendix. Amphibious Ship Capacity Handbook.
AD-A106 949/1 1224 PC **A06**/MF **A01**

AD-A106 950/9
Effects of Intravenous 16,16 Dimethyl Prostaglandin E2 on Bile Salt Induced Injury to Gastric Mucosa in Canine Heidenhain Pouches.
AD-A106 950/9 1141 PC **A02**/MF **A01**

AD-A106 951/7
Preferential Inhibition of Ribonucleic Acid Synthesis by a New Thiosemicarbazone Possessing Antibacterial and Antiparasitic Properties.
AD-A106 951/7 1141 PC **A02**/MF **A01**

AD-A106 952/5
Trypanosoma congolense: Natural and Acquired Resistance in the Bovine.
AD-A106 952/5 1122 PC **A02**/MF **A01**

AD-A106 953/3
Antisecretory Effects of Berberine in Rat Ileum.
AD-A106 953/3 1141 PC **A02**/MF **A01**

AD-A106 954/1
Culicidae.
AD-A106 954/1 1120 PC **A02**/MF **A01**

AD-A106 955/8
Scrub Typhus Antibody in Cynomolgus Monkeys (Macaca fascicularis) in Malaysia.
AD-A106 955/8 1122 PC **A02**/MF **A01**

AD-A106 956/6
In vivo and in vitro Localization of Leishmania within Macrophage Phagolysosomes: Use of Colloidal Gold as a Lysosomal Label.
AD-A106 956/6 1122 PC **A02**/MF **A01**

AD-A106 957/4
Rickettsia tsutsugamushi Antibody in Mother/Cord Pairs of Sera.
AD-A106 957/4 1122 PC **A02**/MF **A01**

AD-A106 958/2
2-Acetylpyridine Thiosemicarbazones. 3. Selenium Analogs as Potential Antimalarial Agents.
AD-A106 958/2 1141 PC **A04**/MF **A01**

AD-A106 959/0
Verdict on Vagotomy.
AD-A106 959/0 1122 PC **A02**/MF **A01**

AD-A106 960/8
Inhibition of in vitro Growth of Plasmodium falciparum by Immune Serum from Monkeys.
AD-A106 960/8 1122 PC **A02**/MF **A01**

AD-A106 961/6
Trypanosoma rhodesiense: Chemical and Immunological Characterization of Variant-Specific Surface Coat Glycoproteins.
AD-A106 961/6 1123 PC **A02**/MF **A01**

AD-A106 962/4
Determination of N-Methyl Pyridinium-2-Aldoxime Chloride and Its Hydrolytic By-Products by Ion-Pair High-Performance Liquid Chromatography.
AD-A106 962/4 1141 PC **A02**/MF **A01**

AD-A106 963/2
Symmetry Extinction of LEED Beams for Naphthalene Adsorbed on Pt(lll).
AD-A106 963/2 1148 PC **A02**/MF **A01**

AD-A106 964/0
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AD-A106 964/0 1148 PC **A02**/MF **A01**

AD-A106 965/7
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AD-A106 966/5
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AD-A106 967/3
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AD-A106 969/9
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AD-A106 970/7
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AD-A106 993/9
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AD-A107 028/3
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AD-A107 029/1
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AD-A107 029/1 1264 PC **A05**/MF **A01**

AD-A107 030/9
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AD-A107 030/9 1107 PC **A04**/MF **A01**

AD-A107 031/7
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AD-A107 031/7 1196 PC **A02**/MF **A01**

AD-A107 032/5
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AD-A107 033/3
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AD-A107 037/4
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AD-A107 039/0 1264 PC **A05**/MF **A01**

AD-A107 040/8
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AD-A107 051/5
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AD-A107 058/0
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AD-A107 059/8
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AD-A107 062/2
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AD-A107 063/0
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AD-A107 064/8
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AD-A107 070/5
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AD-A107 095/2
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AD-A107 096/0
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AD-A107 097/8
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AD-A107 098/6
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AD-A107 108/3
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AD-A107 108/3 1230 PC **A03/MF A01**

AD-A107 109/1
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AD-A107 109/1 1196 PC **A02/MF A01**

AD-A107 110/9
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AD-A107 110/9 1172 PC **A02/MF A01**

AD-A107 111/7
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AD-A107 112/5
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AD-A107 113/3
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AD-A107 114/1
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AD-A107 115/8
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AD-A107 116/6
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AD-A107 121/6
Effects of a Thin SiO2 Layer on the Formation of Metal-Silicon Contacts.
AD-A107 121/6 1263 PC **A02/MF A01**

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Creation and Annihilation of Solitons, Radicals, and Ions in Polyacetylene as Related to the Mechanisms of Isomerization, Doping and Conduction.
AD-A107 122/4 1195 PC **A02/MF A01**

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A New Algorithm for Two-Dimensional Maximum Entropy Power Spectrum Estimation.
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Digital Signal Processing Research.
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Techniques for Speckle Noise Removal.
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Determination of Jupiter's Electron Density Profile from Plasma Wave Observations.
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Development of Microfabrication Techniques.
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The Drift, Diffusion, and Reactions of Slow Ions in Gases - O. N. R. Summary Questionnaire.
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Battery Separators Based on Polyphenylquinoxaline Polymer Blends.
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Cold Regions Testing of an Air-Transportable Shelter,
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Overview of Considerations in Assessing the Biomass Potential of Army Installations.
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EMP/EMI Hardening of Electrical Conduit Systems.
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The Formation of Homogeneous Item Sets When Guessing is a Factor in Item Responses.
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Procedures for Criterion Referenced Tailored Testing.
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Effects of Alcohol Fuels on Engine Wear.
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Depot Support of Gas Turbine Engines.
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Joining the Defense Directives and Defense Acquisition Regulatory Systems,
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Excavation of Eleven Archaic and Woodland Sites in the Divide-Cut Section of the Tennessee-Tombigbee Waterways, Tishomingo County, Mississippi.
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Ignition of Composite Propellants under Rapid Pressure Loading.
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Big River Reservoir Project. Pawcatuck River and Narragansett Bay Drainage Basins. Water and Related Land Resources Study. Volume I. Main Report.
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Cultural Resources Investigations at Redstone Arsenal, Madison County, Alabama. Volume II.
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The Wear of Polymers Sliding on Polymeric Films Deposited on Rough Surfaces.
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The Chemistry of Polyacetylene Doping.
AD-A107 165/3 1195 PC **A02/MF A01**

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Preparation and Characterization of Neutral and Oxidized Polypyrrole Films.
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AD-A107 167/9
(13)C NMR of AsF5 Doped Polyacetylene.
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'Pseudo', A Macro-Based High Level Language for the PDP-11,
AD-A107 168/7 1172 PC **A04/MF A01**

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Covariance Functions and Related Statistical Properties of Acoustic Backscattering from a Randomly Rough Air-Water Interface.
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Radiation Damage Processes in Silicon,
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Archaeological Investigation in the Gainesville Lake Area of the Tennessee-Tombigbee Waterway. Volume IV. Biocultural Studies in the Gainesville Lake Area.
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Initial Skill Training for Navy Enlisted Personnel.
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Obstacles Hamper the Office of Personnel Management's Evaluation of the Implementation of the 1978 Civil Service Reform Act.
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Problems with the Small Business Administration's Merit Appraisal and Compensation System.
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The Comptroller of the Currency Should Decide the Extent to Which His Action Control System is Needed.
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Fewer Agent Transfers Should Benefit the FBI and Its Agents as Well as Save Money.
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The United States Synthetic Fuels Corporation's Project Selection Guidelines Need Clarification.
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FAA's Communications Equipment Replacement Plans.
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Examination of the Effectiveness of Statutory Offices of Inspector General.
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Terminating the Audit of the National Flood Insurance Program's Fiscal 1980 Financial Statements.
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Review of Circumstances of the Mass Removal of Statutory Inspectors General.
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Issues Related to the Longshoremen's and Harbor Workers' Compensation Act.
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The National Institute on Alcohol Abuse and Alcoholism Should Make Greater Efforts to Support Treatment Demonstration Projects.
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Status of Strategic Petroleum Reserve Activities--October 1980.
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Prediction of Aerodynamic Forces on a Circular Cylinder and a Thin Airfoil in a Transonic Airstream by the Finite Element Method.
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The Single and Multiple Vehicle Pickup and Delivery Problem: Exact and Heuristic Algorithms.
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The Equation of State of D2O Determined from Sound Speeds.
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Reversal of Cholera Toxin-Induced Secretion in Rat Ileum by Luminal Berberine.
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Linearized Solution to Inlet Equation with Inertia.
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Myeloproliferative Disorder with Unusual Marrow Chromosome Constitution.
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Densities of NaCl, MgCl2, Na2SO4, and MgSO4 Aqueous Solutions at 1 atm from 0 to 50 C and from 0.001 to 1.5 m.
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Interactions between Large-Scale Coherent Structures and Fine-Grained Turbulence in Free Shear Flows.
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Instability and Transition in Pipes and Channels.
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Optical Processing of Photographic Images.
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The Air-Launched Balloon System (ALBS) Phase II Design Improvement and Test Program.
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Refracted Ray Characteristics from the Geometrical Spreading Equation for Depth-Dependent Media.
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Transient Annealing of Arsenic-Implanted Silicon Using a Graphite Strip Heater.
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Performance Advantage of Complex LMS Controlling Narrow-Band Adaptive Arrays.
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TRACALS Evaluation Report. Airport Surveillance Radar AN/GPN-12. Special Evaluation Report. Salt lake City International Airport and Wendover Auxiliary Airfield, Utah, 3 and 6-15 June 1981.
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User's Manual for UCIN-CABLE: Underwater Cables.
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Some Observations on the Economics of 'Overdesigning' Rubble-Mound Structures with Concrete Armor.
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Prediction of Wave Refraction and Shoaling Using Two Numerical Models.
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Competitive Pathways in Chlorine Dioxide Oxidation of Amines: Amide Formation from Acyclic Amines.
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Determination of Sodium Gluconate in Corrosion-Removing Compounds.
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Predicting Failure of Optical Glass Fibers.
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Laser-Stimulated Molecular Dynamics and Rate Processes.
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Corrosion Fatigue of Metals in Marine Environments.
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Programming Support Library (PSL). Maintenance Manual. Volume II.
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Analysis of Flow Behavior Within An Integrated Computer-Communication Network.
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Mechanisms of Recovering Low Cycle Fatigue Damage in Incoloy 901.
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An Investigation of Flame Stability in a Coaxial Dump Combustor.
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A Statistical Methodology for Constructing Synthetic Test Workloads.
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Long and Short-Term Memory Processes in Cortically Damaged Patients.
AD-A107 258/6 1123 PC **A08**/MF **A01**

AD-A107 259/4
Office of Management and Budget Circular Number A-76 as a Statement of Federal Procurement Policy.
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Structural Design of a Large Deformable Primary Mirror for a Space Telescope.
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Development of an Electronic Interface for a Fiber Optic Interferometric Sensor.
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A Computational Study of the Modification of Raindrop Size Distributions in Subcloud Downdrafts.
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Determination of Ice Crystal Growth Parameters in a Supercooled Cloud Tunnel.
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Digital Command Augmentation for Lateral-Directional Aircraft Dynamics.
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The Determinants of Career Decisions of Air Force Pilots.
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Digital Signal Sorting for Digitized Speech in an Environment of Common Digital Data Signals.
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High Solitary Waves in Water: Results of Calculations.
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Linear Frequency Modulation Derived Polyphase Pulse-Compression Codes and an Efficient Digital Implementation.
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The Lower-Hybrid-Drift Instability in Non-Antiparallel Reversed Field Plasmas.
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Field Experiments with Artificial Aerosols at San Nicolas Island, California.
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Dental Emergencies Occurring among U.S. Army Recruits
AD-A107 271/9 1123 PC **A02**/MF **A01**

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Predictability of Dental Emergencies by Panography.
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The Bermuda Earthquake of March 24, 1978: A Significant Oceanic Intraplate Event.
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Soliton Formation and cis trans Isomerization in Polyacetylene.
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An Exact Penalty Function Algorithm for Optimal Control Problems with Control and Terminal Equality Constraints. Part 1.
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Mission Impact Generalized Explanatory Base Operating Support Model Development: Final Management Summary.
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Theoretical Investigation of Absorptive Processes.
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Development of Instrumentation for Research Probes.
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Statistical Research on Problems Associated with Navy Fire Protection and Fuel Technology Programs.
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HUD Should Strengthen Mortgagee Monitoring to Reduce Losses.
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Budgetary Pressures Created by the Army's Plans to Procure New Major Weapon Systems are Just Beginning.
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Fast, Accurate Two-Person Beach Surveys.
AD-A107 285/9 1157 PC **A02**/MF **A01**

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Evaluation of Replacement Red Smoke Dyes for 1-N Methylaminoanthraquinone.
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Wind Tunnel Tests of Elevon Gap Heating on the Space Shuttle Orbiter (OH-107).
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Quantum-Mechanical Studies on Chemical Reactivity and Ballistic Chemistry. VII. Semiempirical Molecular Orbital Calculations and Experimental Studies on Relative Chemical Reactivities of Isomeric Tetrazole Derivatives, and their Relationship to the Explosive Properties of some Tetrazole Derivatives.
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AD-A107 289/1
Efficient Radiative Transfer Computations in the Atmosphere.
AD-A107 289/1 1084 PC **A04**/MF **A01**

AD-A107 290/9
An Assessment of the Dental Needs of Army Recruits.
AD-A107 290/9 1123 PC **A03**/MF **A01**

AD-A107 291/7
Terrorism; A Bibliography of Books and Periodical Articles.
AD-A107 291/7 1232 PC **A02**/MF **A01**

AD-A107 292/5
Some Unique Applications for Tethered Balloon Systems.
AD-A107 292/5 1077 PC **A02**/MF **A01**

AD-A107 293/3
Surface Drainage Design for Airfields and Heliports in Arctic and Subarctic Regions.
AD-A107 293/3 1205 PC **A04**/MF **A01**

AD-A107 294/1
Pothole Primer. A Public Administrator's Guide to Understanding and Managing the Pothole Problem.
AD-A107 294/1 1205 PC **A03**/MF **A01**

AD-A107 295/8
Target Information Processing: The Effects on Reaction Time of Terrain, Downlook Angle, and Response Processing Level.
AD-A107 295/8 1111 PC **A03**/MF **A01**

AD-A107 296/6
Communications Intelligence: Transcriber Output Enhancement.
AD-A107 296/6 1103 PC **A04**/MF **A01**

AD-A107 297/4
Guidelines for Managing the Flow of Information in an Automated Battlefield Command and Control System.
AD-A107 297/4 1233 PC **A05**/MF **A01**

AD-A107 298/2
Performance as a Factor in Enlisted Promotions.
AD-A107 298/2 1108 PC **A04**/MF **A01**

AD-A107 299/0
Selective Inquiry System/Timesharing Retrieval Subsystem.
AD-A107 299/0 1173 Mag Tape $900.00

AD-A107 300/6
Selective Inquiry System (SIS). Operation Manual and Users Manual.
AD-A107 300/6 1173 PC **A08**/MF **A01**

AD-A107 301/4
Communications: Fiber-Coupled External Cavity Semiconductor Laser.
AD-A107 301/4 1256 PC **A03**/MF **A01**

AD-A107 302/2
International Symposium on Nuclear Techniques in the Study and Control of Parasitic Diseases of Man and Animals.
AD-A107 302/2 1123 PC **A02**/MF **A01**

AD-A107 303/0
Application of Digital Troposcatter to the DCS.
AD-A107 303/0 1234 PC **A07**/MF **A01**

AD-A107 304/8
Bibliography of Soviet Laser Developments, Number 27, January - February 1977.
AD-A107 304/8 1255 PC **A06**/MF **A01**

AD-A107 305/5
Bibliography of Soviet Laser Developments, Number 26, October - December 1976.
AD-A107 305/5 1255 PC **A07**/MF **A01**

AD-A107 306/3
Bibliography of Soviet Laser Developments, Number 28, March - April 1977.
AD-A107 306/3 1255 PC **A05**/MF **A01**

AD-A107 307/1
USAF Food Habits Study. Part IV. Selections, Quantities Selected, and Perceived Portion Sizes.
AD-A107 307/1 1137 PC **A04**/MF **A01**

AD-A107 308/9
Aerosol Composition in the Marine and Coastal Boundary Layer.
AD-A107 308/9 1084 PC **A02**/MF **A01**

AD-A107 309/7
Worst-Case Prediction of Single-Particle-Induced Permanent Failures in Microelectronics.
AD-A107 309/7 1171 PC **A02**/MF **A01**

AD-A107 310/5
Weapon Characteristics.
AD-A107 310/5 1251 PC **A02**/MF **A01**

AD-A107 311/3
Ammunition Characteristics.
AD-A107 311/3 1250 PC **A02**/MF **A01**

AD-A107 312/1
Secondary Combustion in Gun Exhaust Flows.
AD-A107 312/1 1251 PC **A03**/MF **A01**

AD-A107 313/9
U.S. Technology Transfer to the Soviet Union: A Dilemma.
AD-A107 313/9 1090 PC **A07**/MF **A01**

AD-A107 314/7
Muzzle Flow in the Presence of an Anti-Recoil Plate: Exploratory Study.
AD-A107 314/7 1251 PC **A03**/MF **A01**

AD-A107 315/4
Diagnostic and Condition Monitoring System Assessment for Army Helicopter Modular Turboshaft Engines.
AD-A107 315/4 1270 PC **A08**/MF **A01**

AD-A107 316/2
Utilization of Tactical Computers for Training: Field Evaluation Plan.
AD-A107 316/2 1108 PC **A03**/MF **A01**

AD-A107 317/0
PLUMBBOB Series, 1957.
AD-A107 317/0 1241 PC **A14**/MF **A01**

AD-A107 318/8
A Method of Determining the Turbulent Base Pressure in Uniform and Non-Uniform Supersonic Axisymmetric Flows.
AD-A107 318/8 1076 PC **A05**/MF **A01**

AD-A107 319/6
Shock Tube Tests of Muzzle Blast Transducers.
AD-A107 319/6 1251 PC **A04**/MF **A01**

AD-A107 320/4
SIMPLEX 'A' - A Simplified Atmospheric Dispersion Model for Airport Use (Users Guide).
AD-A107 320/4 1205 PC **A02**/MF **A01**

AD-A107 322/0
Selected Articles--Translation.
AD-A107 322/0 1077 PC **A03**/MF **A01**

AD-A107 323/8
Determination of Sample Container Effects on Wearmetals Concentration in MIL-L-7808 Synthetic Lubricant Analyzed on an A/E35U-3 Fluid Analysis Spectrometer.
AD-A107 323/8 1194 PC **A04**/MF **A01**

AD-A107 324/6
Isometric, Isotonic, and Isokinetic Torque Variations in Four Muscle Groups through a Range of Joint Motion.
AD-A107 324/6 1142 PC **A03**/MF **A01**

AD-A107 325/3
High-Speed Rotary Printing Device for Air Traffic Control Applications: A Preliminary Evaluation.
AD-A107 325/3 1237 PC **A02**/MF **A01**

AD-A107 326/1
First Annual Workshop on Aviation Related Electricity Hazards Associated with Atmospheric Phenomena and Aircraft Generated Inputs, February 26-27, 1980.
AD-A107 326/1 1077 PC **A03**/MF **A01**

AD-A107 327/9
Microwave Landing System Flare Subsystem Test.
AD-A107 327/9 1237 PC **A03**/MF **A01**

AD-A107 328/7
Deductive Synthesis of the Unification Algorithm.
AD-A107 328/7 1173 PC **A04**/MF **A01**

AD-A107 329/5
Guideline Development for Summarization of Tactical Data.
AD-A107 329/5 1234 PC **A07**/MF **A01**

AD-A107 330/3
Measurements of Structural Features in Profiles of Mesospheric Density.
AD-A107 330/3 1084 PC **A02**/MF **A01**

AD-A107 331/1
Proton Upsets in LSI Memories in Space.
AD-A107 331/1 1173 PC **A02**/MF **A01**

AD-A107 332/9
On the Accuracy of Low-Energy Electron Diffraction.
AD-A107 332/9 1252 PC **A02**/MF **A01**

AD-A107 333/7
Vibrational Spectra of Oxygen- and Boron-Isotopically Substituted B2O3 Glasses.
AD-A107 333/7 1189 PC **A03**/MF **A01**

AD-A107 334/5
A General Curvilinear Grid Generation Program for Projectile Configurations.
AD-A107 334/5 1250 PC **A05**/MF **A01**

AD-A107 335/2
Nutrition Research--USSR,
AD-A107 335/2 1137 PC **A03**/MF **A01**

AD-A107 336/0
Biophysics of Water: A Working Conference.
AD-A107 336/0 1120 PC **A02**/MF **A01**

AD-A107 337/8
Structural Stability Evaluation, Winnibigoshish Dam.
AD-A107 337/8 1205 PC **A04**/MF **A01**

AD-A107 338/6
Site Characterization for the MBCE/DIRT II Battlefield Environment Tests.
AD-A107 338/6 1236 PC **A04**/MF **A01**

AD-A107 339/4
Establishment of Production Techniques for Transducer Acoustic Delay Lines on a Pilot Line Basis.
AD-A107 339/4 1178 PC **A07**/MF **A01**

AD-A107 340/2
Characterization of Pollutants at Holston Army Ammunition Plant,
AD-A107 340/2 1149 PC **A03**/MF **A01**

AD-A107 341/0
Optimization of Performance of Arc Welding Using Fluxes in Welded Ship Structures from HY-100 and HY-130 KPSI.
AD-A107 341/0 1222 PC **A04**/MF **A01**

AD-A107 342/8
Development of a Computer Based Air Combat Maneuvering Range Debrief System. Volume I.
AD-A107 342/8 1108 PC **A05**/MF **A01**

AD-A107 343/6
Linearized Solution to Inlet Equation with Inertia. Stability of Rubble Mound Breakwaters. Particle Motion under Stokes Waves.
AD-A107 343/6 1158 PC **A02**/MF **A01**

AD-A107 344/4
Use of Titanium to Enhance Wetting of Reaction-Bonded Silicon Nitride by Silicon.
AD-A107 344/4 1190 PC **A02**/MF **A01**

AD-A107 345/1
Spatial Learning and Reasoning Skill.
AD-A107 345/1 1112 PC **A03**/MF **A01**

AD-A107 346/9
Identification or Development of Chemical Analysis Methods for Plants and Animal Tissues.
AD-A107 346/9 1144 PC **A14**/MF **A01**

AD-A107 347/7
As Parents Go, So Go the Children. The Development and Adjustment of Children in the Military.
AD-A107 347/7 1112 PC **A03**/MF **A01**

AD-A107 348/5
Family Roles in Transition. In a Changing Military.
AD-A107 348/5 1113 PC **A03**/MF **A01**

AD-A107 349/3
Military Retention and Retirement. Reciprocal Family/Organization Effects,
AD-A107 349/3 1113 PC **A02**/MF **A01**

AD-A107 350/1
Fields near a Rapidly Propagating Crack-Tip in an Elastic Perfectly-Plastic Material.
AD-A107 350/1 1195 Not available NTIS

AD-A107 351/9
19315AT MLRS, Missile Numbers V13-002, V15-003, Round Numbers V-185/AT-9, V-186/AT-10, 18 August 1981.
AD-A107 351/9 1086 PC **A03**/MF **A01**

AD-A107 352/7
Maximum Likelihood Estimation of Magnitude-Squared Coherence.
AD-A107 352/7 1197 PC **A02**/MF **A01**

AD-A107 353/5
National Dam Safety Program. Crancer Lake Dam (MO 10764), Missouri - Kansas City Basin, Warren County, Missouri. Phase I Inspection Report.
AD-A107 353/5 1205 PC **A04**/MF **A01**

AD-A107 354/3
Pore Size, Zinc Penetration, and Zinc Diffusion Studies on PPQ/CA Separators.
AD-A107 354/3 1187 PC **A03**/MF **A01**

AD-A107 355/0
AGARD Flight Test Instrumentation Series. Volume 13. Practical Aspects of Instrumentation System Installation,
AD-A107 355/0 1077 PC **A09**/MF **A01**

AD-A107 356/8
The Impact of New Guidance and Control Systems on Military Aircraft Cockpit Design.
AD-A107 356/8 1079 PC **A11**/MF **A01**

AD-A107 357/6
Proceedings of a Workshop on the Protection of Personnel against Radiofrequency Electromagnetic Radiation Held at the Royal Air Force Establishment, Farnborough, United Kingdom, 6-8 April 1981.
AD-A107 357/6 1143 PC **A11**/MF **A01**

AD-A107 358/4
Installation Restoration Program. Phase I. Records Search, Hazardous Materials Disposal Sites. Myrtle Beach AFB, South Carolina.
AD-A107 358/4 1205 PC **A06**/MF **A01**

AD-A107 359/2
The Underwater Acoustic Signature of a Nuclear Explosion at the Ocean Surface.
AD-A107 359/2 1241 PC **A03**/MF **A01**

AD-A107 360/0
Seismological Discrimination and Yield Determination Research.
AD-A107 360/0 1168 PC **A05**/MF **A01**

AD-A107 361/8
Ionization and Aerosol Particulates in the Middle Atmosphere.
AD-A107 361/8 1084 PC **A02**/MF **A01**

AD-A107 362/6
Cerebral Economics: Resource Competition within but not Between Hemispheres.
AD-A107 362/6 1112 PC **A03**/MF **A01**

AD-A107 363/4
Boiling Heat Transfer in Confined Space.
AD-A107 363/4 1200 PC **A06**/MF **A01**

AD-A107 364/2
A Comparison of Procedures for Constructing Large Item Pools.
AD-A107 364/2 1197 PC **A04**/MF **A01**

AD-A107 365/9
Isotope Effect in Gas-Surface Vibrational Energy Transfer. Cyclopropane and Cyclopropane-d6 Isomerization by the VEM Technique.
AD-A107 365/9 1149 PC **A03**/MF **A01**

AD-A107 366/7
National Waterways Study Overview of the Transportation Industry.
AD-A107 366/7 1224 PC **A12**/MF **A01**

AD-A107 367/5
The Use of the Sequential Probability Ratio Test in Making Grade Classifications in Conjunction with Tailored Testing.
AD-A107 367/5 1112 PC **A03**/MF **A01**

AD-A107 368/3
Maintenance Operations of the Federal Navigation Channels and Structures at Bolles Harbor, Michigan.
AD-A107 368/3 1206 PC **A05**/MF **A01**

AD-A107 369/1
Confined Disposal Facility at Pointe Mouillee for Detroit and Rouge Rivers.
AD-A107 369/1 1206 PC **A12**/MF **A01**

AD-A107 370/9
Maintenance Dredging of the Federal Navigation Channels in the Detroit River, Michigan.
AD-A107 370/9 1206 PC **A08**/MF **A01**

AD-A107 371/7
Limiting Payload Deceleration during Ground Impact.
AD-A107 371/7 1251 PC **A02**/MF **A01**

AD-A107 372/5
The Worldwide Navigational Warning Service.
AD-A107 372/5 1234 PC **A02**/MF **A01**

AD-A107 373/3
Status of Strategic Petroleum Reserve Activities.
AD-A107 373/3 1266 PC **A02**/MF **A01**

AD-A107 374/1
Information on the U.S. Coast Guard's Decision to Purchase the M/V Cowslip Vessel.
AD-A107 374/1 1231 PC **A02**/MF **A01**

AD-A107 375/8
Allocation of an Air Force Contractor's Pension Fund Assets May be Inequitable.
AD-A107 375/8 1090 PC **A02**/MF **A01**

AD-A107 376/6
Status Report on Implementation of GAO's Audit Findings and Recommendations.
AD-A107 376/6 1090 PC **A03**/MF **A01**

AD-A107 377/4
Information on Peanut Allotment Owners that Lease and Rent Away Rather Than Plant Their Peanut Allotments/Quotas.
AD-A107 377/4 1079 PC **A02**/MF **A01**

AD-A107 378/2
Accelerated Stress Testing of Solar Photovoltaic Modules.
AD-A107 378/2 1184 PC **A03**/MF **A01**

AD-A107 379/0
Inertial Surveying Technology.
AD-A107 379/0 1157 PC **A02**/MF **A01**

AD-A107 380/8
High-Speed Laser Platemaking from Digital Data for the Defense Mapping Agency.
AD-A107 380/8 1156 PC **A02**/MF **A01**

AD-A107 381/6
Primary Dermal Irritation Potential of Components of the M-258A-1 Decontamination Kit (Study 2).
AD-A107 381/6 1144 PC **A02**/MF **A01**

AD-A107 382/4
Primary Dermal Irritation Potential of Components of the M-258A-1 Decontamination Kit (Study 4).
AD-A107 382/4 1144 PC **A02**/MF **A01**

AD-A107 383/2
An Application of Syntactic Pattern Recognition to Seismic Discrimination,
AD-A107 383/2 1238 PC **A03**/MF **A01**

NTIS ORDER/REPORT NUMBER INDEX

AD-A107 384/0
Marine Air Traffic Control and Landing System (MATCALS) Investigation.
AD-A107 384/0 1237 PC **A09**/MF **A01**

AD-A107 385/7
Integration of Theory and Research in Judgment and Decision Making.
AD-A107 385/7 1112 PC **A02**/MF **A01**

AD-A107 386/5
Impact Ionization and Hot Carrier Transport in Semiconductors.
AD-A107 386/5 1263 PC **A02**/MF **A01**

AD-A107 387/3
An Integrated Approach to the Optimization of High-Speed Cam-Follower Systems.
AD-A107 387/3 1224 PC **A02**/MF **A01**

AD-A107 388/1
Laser Photoacoustic Technique for NDE.
AD-A107 388/1 1228 PC **A02**/MF **A01**

AD-A107 389/9
Miscible Polymer Blends Based on Polycarbonate and a Copolyester.
AD-A107 389/9 1195 PC **A02**/MF **A01**

AD-A107 390/7
The Carbonate System in the Western Mediterranean Sea.
AD-A107 390/7 1168 Not available NTIS

AD-A107 391/5
Study of Graphite/Epoxy Composites for Material Flaw Criticality.
AD-A107 391/5 1190 PC **A07**/MF **A01**

AD-A107 392/3
investigation for Low-Cost Permanent Magnets.
AD-A107 392/3 1171 PC **A03**/MF **A01**

AD-A107 393/1
Corrosion Mechanism of Cu-9.4 Ni-1.7 Fe Alloy in 3.4 WT.% NaCl Solution with and without Sulfide Contamination.
AD-A107 393/1 1149 PC **A06**/MF **A01**

AD-A107 394/9
Charged Particle Simulation of Fast Neutron Damage.
AD-A107 394/9 1245 PC **A04**/MF **A01**

AD-A107 395/6
Preparation of Large-Diameter GaAs Crystals.
AD-A107 395/6 1252 PC **A06**/MF **A01**

AD-A107 396/4
TRACALS Evaluation Report. VOR Special Evaluation Report. Williams AFB, Arizona, 22-27 July 1981.
AD-A107 396/4 1237 PC **A03**/MF **A01**

AD-A107 397/2
TRACALS Evaluation Report. Solid State Instrument Landing System AN/GRN-29(V) Initial Evaluation Report, Columbus AFB, Mississippi, 7-20 July 1981.
AD-A107 397/2 1237 PC **A05**/MF **A01**

AD-A107 398/0
Research on Metal Halide Laser Systems.
AD-A107 398/0 1255 PC **A03**/MF **A01**

AD-A107 399/8
National Dam Safety Program. Eaton Dam (MO 31163), Mississippi - Kaskaskia - St. Louis Basin, St. Francois County, Missouri. Phase I Inspection Report.
AD-A107 399/8 1206 PC **A04**/MF **A01**

AD-A107 400/4
National Dam Safety Program. Greenhaven Correction Facility Dam (Inventory Number N.Y. 11700), Lower Hudson River Basin, Duchess County, New York. Phase I Inspection Report,
AD-A107 400/4 1206 PC **A05**/MF **A01**

AD-A107 401/2
National Dam Safety Program. Paterno Dam (Inventory Number N.Y. 101), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 401/2 1206 PC **A03**/MF **A01**

AD-A107 402/0
Preliminary Analysis of Technical Risk and Cost Uncertainty in Selected DARPA Programs.
AD-A107 402/0 1090 PC **A03**/MF **A01**

AD-A107 403/8
Empirical F-Region Model Development Based on S3-1 Satellite Measurements,
AD-A107 403/8 1084 MF **A01**

AD-A107 404/6
Final Electromagnetic Test Report for the M10-76-8000 Radome with XP Plates.
AD-A107 404/6 1238 MF **A01**

AD-A107 405/3
National Dam Safety Program. Lake Casse Dam (Inventory Number N.Y. 1156), Lower Hudson River Basin, Putnam County, New York. Phase I Inspection Report.
AD-A107 405/3 1206 MF **A01**

AD-A107 406/1
National Dam Safety Program. North Lake Dam Number 3 (Inventory Number N.Y. 113), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 406/1 1206 MF **A01**

AD-A107 407/9
National Dam Safety Program. Mamaroneck Reservoir Dam (Inventory Number N.Y. 111), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 407/9 1206 MF **A01**

AD-A107 408/7
National Dam Safety Program. Kirk Lake Dam (Inventory Number N.Y. 682), Lower Hudson River Basin, Putnam County, New York. Phase I Inspection Report,
AD-A107 408/7 1206 MF **A01**

AD-A107 409/5
National Dam Safety Program. White Plains Reservoir Dam Number 2 (Inventory Number N.Y. 24), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 409/5 1207 MF **A01**

AD-A107 410/3
National Dam Safety Program. Long Pond Dam Number 3 (Inventory Number NY 115), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 410/3 1207 MF **A01**

AD-A107 411/1
National Dam Safety Program. Norwich Water Works Dam Number 1 (Inventory Number NY 347), Susquehanna River Basin, Chenango County, New York. Phase I Inspection Report,
AD-A107 411/1 1207 MF **A01**

AD-A107 412/9
National Dam Safety Program. Larchwood Lake Dam (Inventory Number NY 727), Susquehanna River Basin, Otsego County, New York. Phase I Inspection Report,
AD-A107 412/9 1207 MF **A01**

AD-A107 413/7
National Dam Safety Program. Robert L. Bishop Dam (Inventory Number N.Y. 534), Delaware River Basin, Delaware County, New York. Phase I Inspection Report,
AD-A107 413/7 1207 MF **A01**

AD-A107 414/5
National Dam Safety Program. Norwich Reservoir Number 2 Dam (Inventory Number NY 349), Susquehanna River Basin, Chenango County, New York. Phase I Inspection Report,
AD-A107 414/5 1207 MF **A01**

AD-A107 415/2
19304D MLRS, Missile Number V38-002, Round Number V-183/IW-2, 13 August 1981.
AD-A107 415/2 1086 MF **A01**

AD-A107 416/0
National Dam Safety Program. Leatherwood Creek Number 5 (Inventory Number VA 08902), Roanoke River Basin, Henry County, Virginia. Phase I Inspection Report.
AD-A107 416/0 1207 MF **A01**

AD-A107 417/8
National Dam Safety Program. Byram Lake Reservoir Dam (Inventory Number N.Y. 1175), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 417/8 1207 MF **A01**

AD-A107 418/6
National Dam Safety Program. Lake Carmel Dam (Inventory Number N.Y. 100), Lower Hudson River Basin, Putnam County, New York. Phase I Inspection Report,
AD-A107 418/6 1207 MF **A01**

AD-A107 419/4
National Dam Safety Program. Blind Brook Country Club Dam (Inventory Number N.Y. 123), Long Island Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 419/4 1208 MF **A01**

AD-A107 420/2
National Dam Safety Program. Sparkle Lake Dam (Inventory Number N.Y. 1330), Lower Hudson River Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 420/2 1208 MF **A01**

AD-A107 421/0
National Dam Safety Program. Lake Lincoindale Dam (Inventory Number N.Y. 102), Lower Hudson River Basin, Westchester County, New York. Phase I Inspection Report,
AD-A107 421/0 1208 MF **A01**

AD-A107 422/8
Tensile Tests on Articulated Concrete Mattress Specimens.
AD-A107 422/8 1218 PC **A04**/MF **A01**

AD-A107 423/6
On the Design of Simulations of Command and Control Processes.
AD-A107 423/6 1108 PC **A07**/MF **A01**

AD-A107 424/4
Some Guidelines for Effective Task Design in Command and Control Simulations.
AD-A107 424/4 1108 PC **A07**/MF **A01**

AD-A107 425/1
The Effect of Ionospheric Variability on the Accuracy of High Frequency Position Location.
AD-A107 425/1 1237 PC **A03**/MF **A01**

AD-A107 426/9
China's Ballistic Missile Plans--Translation.
AD-A107 426/9 1232 PC **A02**/MF **A01**

AD-A107 429/3
Effect of Hail, Snow, and Melting Hydrometeors on Millimeter Radio Waves.
AD-A107 429/3 1264 PC **A04**/MF **A01**

AD-A107 430/1
On the Expressive Power of Dynamic Logic. II,
AD-A107 430/1 1197 PC **A02**/MF **A01**

AD-A107 431/9
Teleradiology.
AD-A107 431/9 1123 PC **A03**/MF **A01**

AD-A107 432/7
Terminal Forecast Reference Notebook, Camp Casey, Korea.
AD-A107 432/7 1086 PC **A03**/MF **A01**

AD-A107 433/5
Terminal Forecast Reference Notebook, Osan AB, Korea.
AD-A107 433/5 1086 PC **A06**/MF **A01**

AD-A107 434/3
Terminal Forecast Reference Notebook, Fresno Air Terminal, California.
AD-A107 434/3 1086 PC **A05**/MF **A01**

AD-A107 435/0
Control of Air Pollution from Aviation: The Emission Standard Setting Process.
AD-A107 435/0 1208 PC **A12**/MF **A01**

AD-A107 436/8
Design and Fabrication of Coanda Suppressor Flow Visualization Model,
AD-A107 436/8 1270 PC **A03**/MF **A01**

AD-A107 437/6
Proceedings of the 2nd Interservice/Industry Training Equipment Conference Held in Salt Lake City, Utah, November 18 through November 20, 1980.
AD-A107 437/6 1109 PC **A22**/MF **A01**

AD-A107 438/4
Steady/Oscillatory, Supersonic/Hypersonic Inviscid Flow Past Oscillating Wings and Wedge Combinations at Arbitrary Angles of Attack.
AD-A107 438/4 1076 PC **A09**/MF **A01**

AD-A107 439/2
Performance of an Oswatisch Inlet with Hemispherical Centerbody at Zero Angle of Attack.
AD-A107 439/2 1270 PC **A05**/MF **A01**

AD-A107 440/0
An Information System for the Peruvian Air Force Hospital.
AD-A107 440/0 1124 PC **A03**/MF **A01**

AD-A107 441/8
Modeling Solid-Fuel Ramjet Combustion Including Radiation Heat Transfer to the Fuel Surface.
AD-A107 441/8 1270 PC **A03**/MF **A01**

AD-A107 442/6
Effect of Task Duration on Voice Recognition System Performance.
AD-A107 442/6 1104 PC **A04**/MF **A01**

AD-A107 443/4
Estimation of Sensor Detection Probabilities with Data from Concurrent Sensors.
AD-A107 443/4 1178 PC **A03**/MF **A01**

AD-A107 444/2
Enhancing Technology Transfer of Computer Hardware and Software Architectures Using Human Factors in Initial Design.
AD-A107 444/2 1104 PC **A02**/MF **A01**

AD-A107 445/9
Multistage Axial Compressor Program on Tip Clearance Effects.
AD-A107 445/9 1270 PC **A03**/MF **A01**

AD-A107 446/7
Model of Direct Initiation of Unconfined Detonations.
AD-A107 446/7 1251 PC **A02**/MF **A01**

AD-A107 447/5
Identification of Wheelset/Rail Creep Coefficients from Dynamic Response Data Using the Maximum Likelihood Parameter Identification Technique.
AD-A107 447/5 1221 PC **A08**/MF **A01**

AD-A107 448/3
Standardization of Map Symbology for Large Scale Maps.
AD-A107 448/3 1156 PC **A06**/MF **A01**

AD-A107 449/1
Third National Reliability Conference Birmingham, England.
AD-A107 449/1 1173 PC **A02**/MF **A01**

AD-A107 450/9
Implementation of Subcontracting Provisions of Public Law 95-507 within Air Force Logistics Command and Air Force Systems Command.
AD-A107 450/9 1090 PC **A08**/MF **A01**

AD-A107 451/7
Aviation Materiel Combat Ready In-Country (AMCRIC).
AD-A107 451/7 1231 PC **A04**/MF **A01**

AD-A107 452/5
Oceanography of the Grand Banks Region of Newfoundland, March 1974 - Octcber 1974.
AD-A107 452/5 1169 PC **A10**/MF **A01**

AD-A107 453/3
Neurotransmitter Mechanisms in the Nucleus Accumbens Septi and Related Regions in the Rat Brain.
AD-A107 453/3 1142 PC **A06**/MF **A01**

AD-A107 454/1
Design Model for the Heat Transfer in a Short Straight Tube Boiler.
AD-A107 454/1 1200 PC **A09**/MF **A01**

AD-A107 455/8
A Computer Analysis of the Plasma-Boundary Layer Behavior over a Positive Electrode.
AD-A107 455/8 1260 PC **A08**/MF **A01**

AD-A107 456/6
Alert Aircraft Roll Over Chocks.
AD-A107 456/6 1079 PC **A04**/MF **A01**

AD-A107 457/4
Pentamethylcyclopentadienyl Cobaltaboranes Derived from the B5H8(-) and B9H14(-) Ions: Studies in Synthesis and Structure.
AD-A107 457/4 1147 PC **A03**/MF **A01**

AD-A107 458/2
A New Approach for the Control of Cockroaches Utilizing the Entomophilic Nematode DD-136 in Conjunction with Attractants.
AD-A107 458/2 1136 PC **A02**/MF **A01**

AD-A107 459/0
Research in Continuum Mechanics.
AD-A107 459/0 1262 PC **A02**/MF **A01**

AD-A107 460/8
Interpersonal Relations Among Hispanics in the United States: A Content Analysis of the Social Science Literature.
AD-A107 460/8 1113 PC **A13**/MF **A01**

AD-A107 461/6
Variable Metric Relaxation Methods. Part I. A Conceptual Algorithm.
AD-A107 461/6 1199 PC **A06**/MF **A01**

AD-A107 462/4
A Distributed Algorithm for Minimum Weight Directed Spanning Trees.
AD-A107 462/4 1173 PC **A02**/MF **A01**

AD-A107 463/2
The Connection Machine (Computer Architecture for the New Wave).
AD-A107 463/2 1173 PC **A03**/MF **A01**

AD-A107 464/0
Proceedings of the ACM Symposium on Symbolic and Algebraic Computation (1981), Snowbird, Utah, 5-7 August 1981.
AD-A107 464/0 1197 Not available NTIS

AD-A107 465/7
Determination of Contract Suitability to the Award Fee Concept.
AD-A107 465/7 1090 PC **A03**/MF **A01**

AD-A107 466/5
Kink Instabilities in Long Ion Layers.
AD-A107 466/5 1239 PC **A04**/MF **A01**

AD-A107 467/3
Plasma Theory and Simulation.
AD-A107 467/3 1260 PC **A02**/MF **A01**

AD-A107 468/1
Quasineutral Hybrid Simulation of Macroscopic Plasma.
AD-A107 468/1 1260 PC **A03**/MF **A01**

AD-A107 469/9
Field Unit Readiness Study (FURS).
AD-A107 469/9 1109 PC **A02**/MF **A01**

AD-A107 470/7
Flexitime in an Army Medical Center.
AD-A107 470/7 1109 PC **A03**/MF **A01**

AD-A107 471/5
9th Scientific Meeting of the International Epidemiological Association.
AD-A107 471/5 1124 PC **A02**/MF **A01**

AD-A107 472/3
Airborne Communication Systems Career Ladder, AFSC 294X0.
AD-A107 472/3 1109 PC **A04**/MF **A01**

AD-A107 473/1
Fuels Career Ladder AFSC 631X0.
AD-A107 473/1 1109 PC **A05**/MF **A01**

AD-A107 474/9
Energy and Angle Resolve SIMS Studies of CO on Ni(001).
AD-A107 474/9 1149 PC **A02**/MF **A01**

AD-A107 475/6
A 10.6 micrometer Amplitude Modulated Telemeter Laser with Nonlinear Postdetection: Study of a Single Laser System--Translation.
AD-A107 475/6 1256 PC **A04**/MF **A01**

AD-A107 477/2
Effect of Operator Mental Loading on Voice Recognition System Performance.
AD-A107 477/2 1234 PC **A04**/MF **A01**

AD-A107 478/0
ADPE Acquisition: The Acquisition of the Naval Postgraduate School Computer, A Case Study.
AD-A107 478/0 1090 PC **A03**/MF **A01**

AD-A107 479/8
Image Segmentation with Color and Texture,
AD-A107 479/8 1173 PC **A03**/MF **A01**

AD-A107 480/6
Scale Modeling for the PATRIOT Electromagnetic Pulse Test.
AD-A107 480/6 1232 PC **A05**/MF **A01**

AD-A107 481/4
Simulated Tank Anti-Armor Gunnery System (STAGS).
AD-A107 481/4 1251 PC **A09**/MF **A01**

AD-A107 482/2
Cooperative Extension Service's Mission and Federal Role Need Congressional Clarification.
AD-A107 482/2 1102 PC **A04**/MF **A01**

AD-A107 483/0
Soviet News and Propaganda Highlights from 'Red Star' (The Official Newspaper of the Soviet Defense Establishment) for the Period 1-31 July 1981.
AD-A107 483/0 1102 PC **A03**/MF **A01**

AD-A107 484/8
Soviet News and Propaganda Analysis from 'Red Star' (The Official Newspaper of the Soviet Defense Establishment) for the Period 1-31 August 1981. Volume 1. Number 8, 1981.
AD-A107 484/8 1102 PC **A03**/MF **A01**

AD-A107 485/5
Determination of the Relationship between Information Capacity and Identification by Simulated Aerial Photography.
AD-A107 485/5 1230 PC **A03**/MF **A01**

AD-A107 486/3
National Dam Safety Program. Burton-Duenke Dam Number 5 (MO 31608), Missouri - Osage - Gasconade Basin, Camden County, Missouri. Phase I Inspection Report.
AD-A107 486/3 1208 MF **A01**

AD-A107 487/1
National Dam Safety Program. Kehr's Mill Trail Upper Dam (MO 11636), Missouri - Kansas City Basin, St. Louis County, Missouri. Phase I Inspection Report.
AD-A107 487/1 1208 MF **A01**

AD-A107 488/9
Carbon Dioxide Absorption Characteristics of High Performance Sodasorb at 1 Atmosphere.
AD-A107 488/9 1140 PC **A02**/MF **A01**

AD-A107 489/7
The Critical Technologies Project Executive Summary.
AD-A107 489/7 1097 PC **A05**/MF **A01**

AD-A107 490/5
Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236 PC **A08**/MF **A01**

AD-A107 491/3
TRACALS Evaluation Report. Airport Surveillance and Precision Approach Radar AN/GPN-24(V), Initial Evaluation Report, RAF Upper Heyford, England 11 Mar-25 April 81.
AD-A107 491/3 1237 PC **A04**/MF **A01**

AD-A107 492/1
Qualitative Properties of Differential Equations.
AD-A107 492/1 1197 PC **A02**/MF **A01**

AD-A107 493/9
Study of the Two-Photon Photorefractive Effect in Lithium Niobate,
AD-A107 493/9 1256 PC **A02**/MF **A01**

AD-A107 495/4
Energy and Tangential Momentum Accommodation on Different Flashed Tungsten and Gas Covered Tungsten Surfaces.
AD-A107 495/4 1149 PC **A03**/MF **A01**

AD-A107 496/2
The Relationship between Adequacy of Test and Evaluation Data and DS ARC Decisions.
AD-A107 496/2 1090 PC **A08**/MF **A01**

AD-A107 497/0
Recent Geologic History of a Barrier Island.
AD-A107 497/0 1157 PC **A02**/MF **A01**

AD-A107 498/8
Synthesis of Energetic Polymers.
AD-A107 498/8 1147 PC **A04**/MF **A01**

AD-A107 499/6
Military Contractor-Operated Stores' Contracts are Unmanageable and Vulnerable to Abuse.
AD-A107 499/6 1231 PC **A04**/MF **A01**

AD-A107 500/1
Logistics Concerns over Navy's Guided Missile Frigate FFG-Class.
AD-A107 500/1 1224 PC **A04**/MF **A01**

AD-A107 501/9
Microhardness, Friction and Wear of SiC and Si3N4 Materials as a Function of Load, Temperature and Environment.
AD-A107 501/9 1189 PC **A04**/MF **A01**

AD-A107 502/7
Analysis of the Decision and Verification Stockmarket Tasks Using Additive Stage Process Methods.
AD-A107 502/7 1112 PC **A03**/MF **A01**

AD-A107 503/5
Fluorescent Glasses for Use in Fluorescently Pumping Nd 3(+) Doped Laser Glass.
AD-A107 503/5 1255 PC **A02**/MF **A01**

AD-A107 504/3
National Dam Safety Program. Black Tailings Dam (MO 31154), Mississippi - Kaskaskia - St. Louis Basin, Washington County, Missouri. Phase I Inspection Report.
AD-A107 504/3 1206 PC **A05**/MF **A01**

AD-A107 505/0
Missile Safety Qualification of Short Range Air Defense (SHORAD) Missiles.
AD-A107 505/0 1232 PC **A03**/MF **A01**

AD-A107 506/8
Evaluation of the Effectiveness and Efficiency of Preventive Dentistry Programs: Assessment of the Relationship between Past Dental Experience and Dental Sick Call in the Field.
AD-A107 506/8 1124 PC **A03**/MF **A01**

AD-A107 507/6
TRACALS Evaluation Report. Communications Initial Evaluation Report, Hill AFB, Utah, 9-15 June 1981.
AD-A107 507/6 1237 PC **A04**/MF **A01**

AD-A107 508/4
A Numerical Study of the Role of Air-Sea Fluxes in Extratropical Cyclogenesis.
AD-A107 508/4 1086 PC **A07**/MF **A01**

AD-A107 509/2
The Role of the Armed Forces in the Mexican Economy in the 1980's.
AD-A107 509/2 1097 PC **A06**/MF **A01**

AD-A107 510/0
A Descriptive Analysis of First Term Attrition from U.S. Naval Ships.
AD-A107 510/0 1109 PC **A10**/MF **A01**

AD-A107 511/8
A Two-Dimensional Finite Element Advection Model with Variable Resolution.
AD-A107 511/8 1086 PC **A05**/MF **A01**

AD-A107 512/6
Meteorological Factors in High Resolution Satellite Imagery (DMSP).
AD-A107 512/6 1084 PC **A06**/MF **A01**

AD-A107 513/4
Active Superconductive Generator Development 400-Horsepower Generator Design.
AD-A107 513/4 1185 PC **A06**/MF **A01**

AD-A107 514/2
Advances in Sample Introduction for Elemental Analysis.
AD-A107 514/2 1150 PC **A02**/MF **A01**

AD-A107 515/9
Experimental Investigation of Near Real-Time Interpretation Techniques for Transmitted Imagery.
AD-A107 515/9 1103 PC **A04**/MF **A01**

AD-A107 516/7
The Oxidation and Corrosion Resistance of Nitrided Iron Alloys.
AD-A107 516/7 1192 PC **A03**/MF **A01**

AD-A107 517/5
A Program to Compute ELF/VLF Earth-Ionosphere Modal Height Gains via WKB Methods up to Satellite Altitudes.
AD-A107 517/5 1264 PC **A06**/MF **A01**

AD-A107 518/3
Optimal Staging and Scheduling in Airlift Operations.
AD-A107 518/3 1231 PC **A02**/MF **A01**

AD-A107 519/1
An Approach for Assessing Missile System Dormant Reliability.
AD-A107 519/1 1232 PC **A07**/MF **A01**

AD-A107 520/9
Approximation of Processes and Applications to Control and Communication Theory,
AD-A107 520/9 1197 PC **A03**/MF **A01**

AD-A107 521/7
Electromagnetic Transmission through a Rectangular Aperture in a Perfectly Conducting Plane.
AD-A107 521/7 1264 PC **A03**/MF **A01**

AD-A107 522/5
Brittle Materials Design, High Temperature Gas Turbine.
AD-A107 522/5 1189 PC **A11**/MF **A01**

AD-A107 523/3
Atmospheric Fluctuations Which Lead to Trackable Radar Signals in the Marine Boundary Layer.
AD-A107 523/3 1238 PC **A07**/MF **A01**

AD-A107 524/1
Evaluation of Tests for Determining the Pumpability of Concrete Mixtures.
AD-A107 524/1 1218 PC **A04**/MF **A01**

AD-A107 525/8
Scanning Electron Microscopy/1981/III. An International Journal of Scanning Electron Microscopy, Related Techniques, and Applications. Part III,
AD-A107 525/8 1140 Not available NTIS

AD-A107 526/6
Integrated Balanced FETs for Broadband Millimeter Wave Amplifiers.
AD-A107 526/6 1171 PC **A03**/MF **A01**

AD-A107 527/4
The Development of a High Average Power Glass Laser Source.
AD-A107 527/4 1255 PC **A02**/MF **A01**

AD-A107 528/2
Structure Study of Oxygen-Adsorbed Ni(111) Surface by High Energy Ion Scattering.
AD-A107 528/2 1150 PC **A03**/MF **A01**

AD-A107 529/0
Design and Utilization of an Infrared Data Base for an Advanced Image Interpretation Facility.
AD-A107 529/0 1173 PC **A05**/MF **A01**

AD-A107 530/8
Application of Tactical Data Systems for Training. Volume IV. Development of Courseware and Analysis of Results for GED Math.
AD-A107 530/8 1109 PC **A13**/MF **A01**

NTIS ORDER/REPORT NUMBER INDEX

AD-A107 531/6
Utilization of Tactical Computers for Training: Analysis of System and Training Requirements.
AD-A107 531/6 1109 PC **A03**/MF **A01**

AD-A107 532/4
Development of Data Processing Strategies for Potential Application in the Tactical Operations Systems (TOS) and Other Tactical Data Systems.
AD-A107 532/4 1232 PC **A08**/MF **A01**

AD-A107 533/2
The Impact of Multiprocessor Technology on High-Level Language Design.
AD-A107 533/2 1173 PC **A07**/MF **A01**

AD-A107 534/0
Automatic Input Data Generation for ADINA and NASTRAN Structural Computer Codes.
AD-A107 534/0 1262 PC **A06**/MF **A01**

AD-A107 535/7
The Army Racial Awareness Program: A Case Study of Program Impact on Personal Values.
AD-A107 535/7 1113 PC **A03**/MF **A01**

AD-A107 536/5
Process for Fragment Layup, Filler Application, and Outer Coating for PATRIOT GM Warhead M248.
AD-A107 536/5 1232 PC **A06**/MF **A01**

AD-A107 537/3
Kinematics, Dynamics, and Estimation of Rigid-Body Motion Using Euler Parameters (Quaternions).
AD-A107 537/3 1273 PC **A04**/MF **A01**

AD-A107 538/1
Environmental Failure of Adhesive Bonding in Composites.
AD-A107 538/1 1190 PC **A03**/MF **A01**

AD-A107 539/9
Surface Acoustic Wave Microwave Oscillator and Frequency Synthesizer.
AD-A107 539/9 1178 PC **A07**/MF **A01**

AD-A107 540/7
National Dam Safety Program. MO Noname 27 Dam (MO 10353), Missouri - Nemaha - Nodaway Basin, Holt County, Missouri. Phase I Inspection Report.
AD-A107 540/7 1208 PC **A04**/MF **A01**

AD-A107 541/5
Kinetics of Neutrophil-Releasing Activity of Post-Leukapheresis Plasma.
AD-A107 541/5 1124 PC **A04**/MF **A01**

AD-A107 542/3
National Dam Safety Program. No Name 165 (Crystal Lake Dam) (MO 10580), Missouri - Kansas City Basin, Jackson County, Missouri. Phase I Inspection Report.
AD-A107 542/3 1208 PC **A03**/MF **A01**

AD-A107 543/1
National Dam Safety Program. No Name 548 Pfizer Inc. Dam (MO 30705), Mississippi - Kaskaskia - St. Louis Basin, Washington County, Missouri. Phase I Inspection Report.
AD-A107 543/1 1208 PC **A03**/MF **A01**

AD-A107 544/9
Effects of Temperature on Excited-State Descriptions of Luminescent Photoelectrochemical Cells Employing Tellrium-Doped Cadmium Sulfide Electrodes.
AD-A107 544/9 1150 PC **A02**/MF **A01**

AD-E001-182
An Appraisal of Performance Appraisal Summary Results of a Large Scale Study.
AD-A106 865/9 1105 PC **A04**/MF **A01**

AD-E001-183
A Validity Comparison of Adaptive and Conventional Strategies for Mastery Testing.
AD-A106 867/5 1106 PC **A03**/MF **A01**

AD-E001-184
Systems Are Not Solutions: Issues in Creating Information Systems That Account for the Human Organization.
AD-A106 866/7 1094 PC **A03**/MF **A01**

AD-E400-720
Simulation Testing of Weapon Systems.
AD-A106 821/2 1251 PC **A03**/MF **A01**

AD-E400-722
Characterization of Pollutants at Holston Army Ammunition Plant,
AD-A107 340/2 1149 PC **A03**/MF **A01**

AD-E400-724
Process for Fragment Layup, Filler Application, and Outer Coating for PATRIOT GM Warhead M248.
AD-A107 536/5 1232 PC **A06**/MF **A01**

AD-E430-701
Shock Tube Tests of Muzzle Blast Transducers.
AD-A107 319/6 1251 PC **A04**/MF **A01**

AD-E500-414
Planning Amphibious Lift Forces. Appendix. Amphibious Ship Capacity Handbook.
AD-A106 949/1 1224 PC **A06**/MF **A01**

AD-E500-419
Software Technology Transfer and Export Control.
AD-A106 869/1 1097 PC **A07**/MF **A01**

AD-E500-431
The Critical Technologies Project Executive Summary.
AD-A107 489/7 1097 PC **A05**/MF **A01**

AD-E700-003
Manufacturing Methods and Technology Project Execution Report.
AD-A106 868/3 1088 PC **A08**/MF **A01**

AD-E850-101
Terminal Forecast Reference Notebook, Fresno Air Terminal, California.
AD-A107 434/3 1086 PC **A05**/MF **A01**

AD-E850-103
Terminal Forecast Reference Notebook, Osan AB, Korea.
AD-A107 433/5 1086 PC **A06**/MF **A01**

AD-E850-104
Terminal Forecast Reference Notebook, Camp Casey, Korea.
AD-A107 432/7 1086 PC **A03**/MF **A01**

AD-E950-174
Signal Analysis Van Hardware Operation General Description. Volume 1.
AD-A106 948/3 1238 PC **A03**/MF **A01**

AD-E950-175
Active RF Seeker Analysis for Land Combat Seekers.
AD-A106 947/5 1238 PC **A04**/MF **A01**

AD-E950-176
Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236 PC **A08**/MF **A01**

AECL-6343
Laser-Matter Interaction.
AECL-6343 1260 PC **A07**/MF **A01**

AECL-6404
Hydrogeological and Geochemical Studies in the Perch Lake Basin. A Second Report of Progress.
AECL-6404 1157 PC **A13**/MF **A01**

AEDC-TSR-80-P3
Wind Tunnel Test of a Self-Optimizing Flexible Technology Wing.
AD-A106 926/9 1077 PC **A02**/MF **A01**

AEDC-TSR-81-V7
Wind Tunnel Tests of Elevon Gap Heating on the Space Shuttle Orbiter (OH-107).
AD-A107 287/5 1272 PC **A03**/MF **A01**

AFCRL-TR-76-0056
Electromagnetic Transmission through a Rectangular Aperture in a Perfectly Conducting Plane.
AD-A107 521/7 1264 PC **A03**/MF **A01**

AFGL-TR-81-0184
Study of Meteorological Conditions Along Actual or Proposed Reentry Trajectories.
AD-A107 035/8 1273 PC **A05**/MF **A01**

AFGL-TR-81-0203
Development of Instrumentation for Research Probes.
AD-A107 280/0 1086 PC **A09**/MF **A01**

AFGL-TR-81-0238
Chatanika Radar Measurements during the Auroral E Program.
AD-A107 117/4 1083 PC **A03**/MF **A01**

AFGL-TR-81-0295
Attenuation Problems Associated with a 5 cm Radar.
AD-A107 215/6 1238 PC **A02**/MF **A01**

AFGL-TR-81-0296
Measurements of Structural Features in Profiles of Mesospheric Density.
AD-A107 330/3 1084 PC **A02**/MF **A01**

AFGL-TR-81-0297
Some Unique Applications for Tethered Balloon Systems,
AD-A107 292/5 1077 PC **A02**/MF **A01**

AFGL-TR-81-0298
Empirical F-Region Model Development Based on S3-1 Satellite Measurements,
AD-A107 403/8 1084 MF **A01**

AFGL-TR-81-0310
The Air-Launched Balloon System (ALBS) Phase II Design Improvement and Test Program.
AD-A107 214/9 1077 PC **A02**/MF **A01**

AFGL-TR-81-0315
Proton Upsets in LSI Memories in Space.
AD-A107 331/1 1173 PC **A02**/MF **A01**

AFGL-TR-81-0320
Limiting Payload Deceleration during Ground Impact,
AD-A107 371/7 1251 PC **A02**/MF **A01**

AFHRL-TP-81-23
Computer Image Generation: Advanced Visual/Sensor Simulation.
AD-A107 098/6 1172 PC **A04**/MF **A01**

AFHRL-TP-81-30
Mission Impact Generalized Explanatory Base Operating Support Model Development: Final Management Summary.
AD-A107 277/6 1089 PC **A03**/MF **A01**

AFIT/AE/DS79-1
An Investigation of Flame Stability in a Coaxial Dump Combustor.
AD-A107 256/0 1264 PC **A11**/MF **A01**

AFIT-CI-79-212D
Mechanisms of Recovering Low Cycle Fatigue Damage in Incoloy 901.
AD-A107 255/2 1192 PC **A12**/MF **A01**

AFIT-CI-79-213D
Analysis of Flow Behavior Within An Integrated Computer-Communication Network,
AD-A107 254/5 1233 PC **A12**/MF **A01**

AFIT-CI-79-215D
An Investigation of Flame Stability in a Coaxial Dump Combustor.
AD-A107 256/0 1264 PC **A11**/MF **A01**

AFIT-CI-79-216D
Prediction of Aerodynamic Forces on a Circular Cylinder and a Thin Airfoil in a Transonic Airstream by the Finite Element Method.
AD-A107 201/6 1076 PC **A09**/MF **A01**

AFIT-CI-79-252T
Determination of the Relationship between Information Capacity and Identification by Simulated Aerial Photography.
AD-A107 485/5 1230 PC **A03**/MF **A01**

AFIT-CI-79-254T
Identification of Wheelset/Rail Creep Coefficients from Dynamic Response Data Using the Maximum Likelihood Parameter Identification Technique.
AD-A107 447/5 1221 PC **A08**/MF **A01**

AFIT-CI-79-269D
Topographically Induced Diurnal Boundary Layer Oscillations: Two Dimensional Synoptic Scale Modeling.
AD-A107 199/2 1086 PC **A09**/MF **A01**

AFIT-CI-79-300T-S
Feline Malignant Lymphoma: A Multiway Frequency Analysis of a Population Involving Sex, Age, Cell Type, and Tumor Location.
AD-A106 825/3 1122 PC **A03**/MF **A01**

AFIT-CI-79-302T-S
Testing of RPMI-1640 as a Nutrient Medium for Fresh Semilunar Valve Storage.
AD-A106 824/6 1140 PC **A04**/MF **A01**

AFIT-CI-79-304D-S
The Effects of Diet Calcium, Protein and Acidity on Calcium Retention in the Rat, Particularly as Related to the Inner and Outer Surfaces of Tubular Bone: A Possible Model for the Treatment or Prevention of Osteoporosis.
AD-A107 200/8 1123 PC **A12**/MF **A01**

AFIT-CI-79-305D-S
A Statistical Methodology for Constructing Synthetic Test Workloads.
AD-A107 257/8 1172 PC **A09**/MF **A01**

AFIT-CI-79-307D-S
Evaluation of Gamma Radiation for Destruction of Pentachlorophenol in Aqueous Solution and on Activated Carbon.
AD-A106 943/4 1154 PC **A05**/MF **A01**

AFIT-CI-79-308T
Fathering and the Pediatric Cancer Experience.
AD-A106 945/9 1122 PC **A05**/MF **A01**

AFIT-CI-79-317-T-S
Standardization of Map Symbology for Large Scale Maps.
AD-A107 448/3 1156 PC **A06**/MF **A01**

AFIT-CI-81-9D
The Determinants of Career Decisions of Air Force Pilots.
AD-A107 265/1 1108 PC **A10**/MF **A01**

AFIT-CI-81-10T
Office of Management and Budget Circular Number A-76 as a Statement of Federal Procurement Policy.
AD-A107 259/4 1089 PC **A06**/MF **A01**

AFIT-CI-81-12D
Automatic Microwave Network Analyzer Calibration by Reference to a Transmission-Line Standard with Applications to Characterization of Adapters, Devices, and Coaxial Lines with SMA Connectors.
AD-A107 198/4 1227 PC **A09**/MF **A01**

AFIT-CI-81-15D
Structural Design of a Large Deformable Primary Mirror for a Space Telescope.
AD-A107 260/2 1256 PC **A09**/MF **A01**

AFIT-CI-81-26D
Control of Air Pollution from Aviation: The Emission Standard Setting Process.
AD-A107 435/0 1208 PC **A12**/MF **A01**

AFIT-CI-81-36T
Determination of Ice Crystal Growth Parameters in a Supercooled Cloud Tunnel.
AD-A107 263/6 1084 PC **A07**/MF **A01**

AFIT-CI-81-37T
Efficient Radiative Transfer Computations in the Atmosphere.
AD-A107 289/1 1084 PC **A04**/MF **A01**

AFIT-CI-81-44D
A Computational Study of the Modification of Raindrop Size Distributions in Subcloud Downdrafts.
AD-A107 262/8 1084 PC **A08**/MF **A01**

AFIT-CI-81-50D
The Single and Multiple Vehicle Pickup and Delivery Problem: Exact and Heuristic Algorithms.
AD-A107 202/4 1199 PC **A10**/MF **A01**

AFIT-CI-81-54D
Long and Short-Term Memory Processes in Cortically Damaged Patients.
AD-A107 258/6 1123 PC **A08**/MF **A01**

AFIT-CI-81-55T
Digital Command Augmentation for Lateral-Directional Aircraft Dynamics.
AD-A107 264/4 1079 PC **A10**/MF **A01**

AFIT/DS/AA/79M-1
Prediction of Aerodynamic Forces on a Circular Cylinder and a Thin Airfoil in a Transonic Airstream by the Finite Element Method.
AD-A107 201/6 1076 PC **A09**/MF **A01**

AFIT-LSSR-17-81
Implementation of Subcontracting Provisions of Public Law 95-507 within Air Force Logistics Command and Air Force Systems Command.
AD-A107 450/9 1090 PC **A08**/MF **A01**

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BNL-29776
Simple Computer Program to Model 3-Dimensional Underground Heat Flow with Realistic Boundary Conditions.
DE81030213 1200 PC **A02**/MF **A01**

BNL-29826
Review of Melting and Evaporation of Fusion-Reactor First Walls.
DE81030035 1239 PC **A02**/MF **A01**

BNL-29948
Search for Promethium-Like Gold Lines and Other Transitions of Interest to Fusion Research.
DE81029917 1239 PC **A02**/MF **A01**

BNL-29963
Modeling Solar-Energy Systems for Economic Optimization.
DE81030030 1181 PC **A02**/MF **A01**

BNL-30027
Heterogeneity and Expression of the Zein Storage Protein Gene Family of Maize.
DE81030735 1120 PC **A02**/MF **A01**

BNL-51312
Method for Estimating Technoiogical Penetration Rates in Commercial Automobile Fleets.
DE82000433 1221 PC **A05**/MF **A01**

BNL-51358
Expert Judgments for Policy Analysis.
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High Concentration Dust Monitor.
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Development of Fuel Cell Gas Detection Instruments for Use in a Mine Atmosphere.
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BUMINES-RI-8564
Factor of Safety Charts for Estimating the Stability of Saturated and Unsaturated Tailings Pond Embankments.
PB82-135518 1167 PC **A06**/MF **A01**

BUMINES-RI-8567
Evaluation of the Seismic System for Locating Trapped Miners.
PB82-138660 1167 PC **A04**/MF **A01**

BUMINES-RI-8569
Water Jet Perforation: A New Method of Completing and Simulating In situ Leaching Wells.
PB82-135583 1167 PC **A03**/MF **A01**

BUMINES-RI-8573
Modification of a Commercial Atomic Absorption Spectrophotometer for Cold-Vapor Determination of Mercury.
PB82-135716 1229 PC **A02**/MF **A01**

BUMINES-RI-8591
Protection Factors of the Airstream Helmet.
PB82-135575 1143 PC **A02**/MF **A01**

BUMINES-TPR-114
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PB82-135724 1167 PC **A02**/MF **A01**

C-OF-A-MEMO-8109
A Wake Source Model for Non-Symmetric Flow past Bluff Bodies in Two-Dimensional Flow.
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PB82-136748 1176 PC **A07**/MF **A01**

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PB82-136755 1176 PC **A07**/MF **A01**

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PB82-136763 1176 PC **A10**/MF **A01**

CE-STR-81-24
Inference Procedure with Uncertainty for Problem Reduction Method.
PB82-131772 1198 PC **A03**/MF **A01**

CEA-CONF-4469
Evaluation of the Capture Cross Section of exp 169 Tm from 10 exp -5 EV to 2.10 exp 7 EV.
CEA-CONF-4469 1257 PC **A02**/MF **A01**

CEA-CONF-4492
SPH Homogeneization Method.
CEA-CONF-4492 1249 PC **A02**/MF **A01**

CED-81-151
SBA's Progress in Implementing the Public Law 95-507 Subcontracting and Surety Bond Waiver Provisions Has Been Limited.
PB82-133844 1092 PC **A03**/MF **A01**

CED-82-1
User Charge Revenues for Wastewater Treatment Plants--Insufficient to Cover Operation and Maintenance.
PB82-137761 1215 PC **A03**/MF **A01**

CED-82-4
Requests for Federal Disaster Assistance Need Better Evaluation.
PB82-139122 1115 PC **A04**/MF **A01**

CERC-CETA-81-7
Some Observations on the Economics of 'Overdesigning' Rubble-Mound Structures with Concrete Armor.
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CERC-CETA-81-11
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CERC-REPRINT-81-9
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EMP/EMI Hardening of Electrical Conduit Systems.
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Overview of Considerations in Assessing the Biomass Potential of Army Installations.
AD-A107 132/3 1266 PC **A04**/MF **A01**

CERL-TR-N-111
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CONF-780892-2
Study of Neutrino-Produced Dimuons Using the Fermilab 15-Foot Bubble Chamber and External Muon Identifier.
DE81025788 1257 PC **A02**/MF **A01**

CONF-780926-26
Evaluation of the Capture Cross Section of exp 169 Tm from 10 exp -5 EV to 2.10 exp 7 EV.
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KFK-2785 1247 PC **A02**/MF **A01**

CONF-790327-111
Stability of Intense Transported BEAMS.
LBL-8382 1257 PC **A02**/MF **A01**

CONF-790524-13
Spermatogonial Stem Cell Renewal Following Irradiation.
LBL-10109 1143 PC **A02**/MF **A01**

CONF-790529-9
Single-Point Diamond-Turned Mirror Performance Before and after Polishing.
LA-UR-79-2059 1256 PC **A02**/MF **A01**

CONF-790845-(SUP.)
Solar 79 Northwest.
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CONF-791058-11
Delayed Neutron Calculations Using ENDF/B-V Data.
LA-UR-79-2890 1259 PC **A02/MF A01**

CONF-791103-70
Mockup Testing of Remote Systems for Zirconium Fuel Dissolution Process at the Idaho Chemical Processing Plant.
CONF-791103-70 1243 PC **A03/MF A01**

CONF-791233-2
Evaluation of Residential Building Energy-Performance Standards.
LBL-9816 1201 PC **A03/MF A01**

CONF-791233-6
New Measurement Strategy for in Situ Testing of Wall Thermal Performance.
LBL-8822 1226 PC **A03/MF A01**

CONF-800170-(VOL.4)
Seminar on Countermeasures for Pipe Cracking in BWRs.
DE82900055 1247 PC **A13/MF A01**

CONF-800315-12
In-Process Inventory Estimation for Pulsed Columns and Mixer-Settlers.
LA-UR-80-741 1248 PC **A02/MF A01**

CONF-800403-42
Fuel Damage Estimates for the TMI-2 Reactor.
LA-UR-80-1069 1248 PC **A02/MF A01**

CONF-800425-6
Potential Uses of Spent Shale in the Treatment of Oil Shale Retort Waters.
LBL-11072 1209 PC **A02/MF A01**

CONF-800435-1
Resistive G-Modes and Ballooning.
LA-UR-80-738 1261 PC **A02/MF A01**

CONF-800460-3
Thermodynamics of the Tantalum-Carbon-Chlorine-Hydrogen System Applied to the CVD of Carbide/Carbon Composite Materials.
LA-UR-80-1252 1190 PC **A03/MF A01**

CONF-800484-5
Magnetic Islands and Stochastic Field Lines in the RFP.
LA-UR-80-2406 1239 PC **A02/MF A01**

CONF-800507-7(REV.)
Thermomechanical Modeling and Data Analysis for Heating Experiments at Stripa, Sweden.
LBL-10193(Rev.) 1245 PC **A02/MF A01**

CONF-800606-1
Design Analysis for the Control and Drive Retrofit of a Numerically Controlled Lathe.
LA-UR-80-621 1224 PC **A02/MF A01**

CONF-800610-5
Using Diffusion Measurements to Determine Pore-Size Distributions in Porous Materials.
LA-UR-80-635(Rev.) 1151 PC **A02/MF A01**

CONF-800655-3
Excited-State Proton Transfer Kinetics in 1-Naphthol Compounds and Organometallic Complexes.
LA-UR-80-1928 1151 PC **A02/MF A01**

CONF-800661-1
Numerical Simulation of Reactive Flow in Internal Combustion Engines.
LA-UR-80-1633 1271 PC **A02/MF A01**

CONF-800693-1
Data Acquisition and Control for gamma Scanning.
LA-UR-80-1358 1241 PC **A02/MF A01**

CONF-800699-2
Block Relaxation Strategies.
LA-UR-80-2342 1197 PC **A02/MF A01**

CONF-800710-1
Kinetic Behavior of Subbituminous Coal Drying; Effects of Confining Pressure.
LA-UR-80-551 1165 PC **A02/MF A01**

CONF-800716-2
Princetown I Data Analysis.
MLM-2731(OP) 1268 PC **A02/MF A01**

CONF-800723-3
TRAC Posttest Calculations of Semiscale Test S-06-3.
LA-UR-80-716 1247 PC **A02/MF A01**

CONF-800724-13
Calculability of the n-p Mass Difference in Gauge Theories.
LA-UR-80-2450 1259 PC **A02/MF A01**

CONF-800757-2
Overview of the US Program for Nonconvecting Solar Ponds.
LA-UR-80-2134 1181 PC **A02/MF A01**

CONF-800806-14
HTGR-GT Closed-Cycle Gas Turbine: A Plant Concept with Inherent Cogeneration (Power Plus Heat Production) Capability.
GA-A-15837 1242 PC **A02/MF A01**

CONF-800814-14
Status of exp 241 Am Recovery and Purification at Los Alamos Scientific Laboratory.
LA-UR-80-2414 1240 PC **A02/MF A01**

CONF-800815-2
Statistical Validity for Electron Probe Microanalysis of Organic Sulfur in Coal.
LA-UR-80-585 1228 PC **A02/MF A01**

CONF-800824-16
Measurement of K/sub NN/, K/sub SS/, K/sub SL/, and K/sub LL/ in Polarized Np Implies Polarized Pn at 800 MeV in the CEX Region.
LA-UR-80-1976 1259 PC **A02/MF A01**

CONF-800824-17
Polarized Targets and Polarized Low Energy Neutrons at WNR.
LA-UR-80-1933 1242 PC **A02/MF A01**

CONF-800824-18
Polarimeter for Protons Between 300 and 800 MeV.
LA-UR-80-1940 1241 PC **A02/MF A01**

CONF-800824-20
Polarization Transfer in Inelastic Scattering.
LA-UR-80-2427 1259 PC **A02/MF A01**

CONF-800919-3
Seismic Isolation of an Electron Microscope.
LBL-10386 1228 PC **A02/MF A01**

CONF-800920-1
Magnetotelluric/Audiomagnetotelluric Study of the Zuni Hot Dry Rock Geothermal Prospect, New Mexico.
LA-UR-80-1486 1165 PC **A02/MF A01**

CONF-800920-22
Analysis of Injection Testing of Geothermal Reservoirs.
LBL-10985 1166 PC **A02/MF A01**

CONF-800931-2
Location of Hydraulic Fractures Using Microseismic Techniques.
LA-UR-80-2103 1165 PC **A02/MF A01**

CONF-800931-3
Directional Drilling Equipment and Techniques for Deep Hot Granite Wells.
LA-UR-80-2086 1165 PC **A02/MF A01**

CONF-800948-1
Stable Heating and Burn Simulations of a Reversed-Field Pinch Reactor.
LA-UR-80-2500 1239 PC **A02/MF A01**

CONF-800950-1
Inertial Confinement Fusion Reactor Systems.
LA-UR-80-2499 1239 PC **A02/MF A01**

CONF-801009-2
Efficient Access of Compressed Data.
LBL-10648 1095 PC **A02/MF A01**

CONF-801015-1
Air Quality Regulation in Spatial Equilibrium Models.
LA-UR-80-1753 1209 PC **A03/MF A01**

CONF-801047-1
LASL Thermochemical Hydrogen Program Status on September 30, 1980.
LA-UR-80-2400 1268 PC **A02/MF A01**

CONF-801176-1
Thermodynamic Data for Flue-Gas Desulfurization Processes.
DE81030545 1150 PC **A04/MF A01**

CONF-810404-2
High-Current Resistance Welding of Nuclear-Waste Containers.
DE81030403 1243 PC **A02/MF A01**

CONF-810508-3
Operating-Procedure System at Savannah River Plant.
DE81030405 1090 PC **A02/MF A01**

CONF-810511-
Ambipolar Potential Formation and Control in Bumpy Tori and Mirrors.
DE81030636 1239 PC **A20/MF A01**

CONF-810809-18
Magnetic Susceptibility of Curium Pnictides.
DE82000148 1263 PC **A02/MF A01**

CONF-810831-57
Effect of Microstructure on the Mechanical Properties of a Commercial 12Cr-1Mo Steel (HT-9).
DE82000082 1248 PC **A02/MF A01**

CONF-810868-2
Search for Promethium-Like Gold Lines and Other Transitions of Interest to Fusion Research.
DE81029917 1239 PC **A02/MF A01**

CONF-810871-2
Thermonuclear Model for gamma -Ray Bursts.
DE81030635 1082 PC **A02/MF A01**

CONF-810872-2
Phonons in Alkali Graphite Intercalation Compounds.
DE82000059 1151 PC **A02/MF A01**

CONF-810872-3
Thermal Expansion of Alkali-Graphite Intercalation Compounds.
DE82000060 1151 PC **A02/MF A01**

CONF-810872-4
Lattice Dynamics of Graphite Intercalation Compounds: Modelled by the Phonon Dispersion of Linear Chains.
DE82000061 1151 PC **A02/MF A01**

CONF-810905-7
Determination of the Statistical Distributions of Model Parameters for Probabilistic Risk Assessment.
DE82000147 1197 PC **A02/MF A01**

CONF-810905-10
CRRIS: A Computerized Radiological Risk-Investigation System.
DE82000136 1143 PC **A02/MF A01**

CONF-810906-10
High-beta Studies with Beam-Heated, Non-Circular Plasmas in ISX-B.
DE81032003 1239 PC **A02/MF A01**

CONF-810909-8
Environmental Impacts Associated with Using Peat for Energy.
DE81032000 1209 PC **A02/MF A01**

CONF-810923-9
Effect of Thermomechanical Properties on Initial Cavity Growth.
DE81030839 1161 PC **A02/MF A01**

CONF-810923-10
Effects of Gas-Flow Pattern on Cavity Shape.
DE82000347 1161 PC **A02/MF A01**

CONF-810942-4
Experimental Work Related to Two Bismuth Sulfate Cycles and Their Possible Improvement. Outline of a Possible Antimonyl Sulfate Cycle with Separate Evolution of Sulfur Dioxide and Oxygen.
DE81030236 1267 PC **A02/MF A01**

CONF-810944-5
Rf Field Effects on the Cyclotron Arc Source.
DE81030972 1257 PC **A02/MF A01**

CONF-810953-2
Aqueous Dissolution of Calcium Metaphosphate Glasses.
DE81030130 1189 PC **A02/MF A01**

CONF-810956-1
Leaching of Nuclear-Waste Forms.
DE81030490 1243 PC **A02/MF A01**

CONF-810957-1
Comparison of the ENDF/B-V and SOKRATOR Evaluations of exp 235 U, exp 239 Pu, exp 240 Pu and exp 241 Pu at Low Neutron Energies.
DE81032037 1258 PC **A03/MF A01**

CONF-810959-1
Chemicals Identified in Human Biological Media.
DE81030813 1141 PC **A02/MF A01**

CONF-811013-4
Temperature and Concentration Transients in the Aluminum-Air Battery.
DE81030338 1188 PC **A02/MF A01**

CONF-811025-1
Applications of DHDECMP Extraction Chromatography to Nuclear Analytical Chemistry.
DE81030134 1150 PC **A02/MF A01**

CONF-811030-2
Modeling Solar-Energy Systems for Economic Optimization.
DE81030030 1181 PC **A02/MF A01**

CONF-811101-9
Reducing Conventive Losses from Cover Glazings of Solar-Thermal Collectors.
DE81025726 1200 PC **A02/MF A01**

CONF-811101-10
Review of Melting and Evaporation of Fusion-Reactor First Walls.
DE81030035 1239 PC **A02/MF A01**

CONF-811101-11
Simple Computer Program to Model 3-Dimensional Underground Heat Flow with Realistic Boundary Conditions.
DE81030213 1200 PC **A02/MF A01**

-CONF--811103--2
Evaluation of Proposed Methods of Radioactive Material Container Tie-down Design for Truck Transport.
DE81024032 1242 PC **A02/MF A01**

CONF-811103-5
Experimental Source Term Data Base for Assessing the Safety of Spent Fuel Transportation.
DE81023692 1243 PC **A02/MF A01**

CONF-811103-9
Sensitivity Analysis of Transportation Parameters on Spent-Fuel-Cask Projections.
DE81025833 1243 PC **A02/MF A01**

CONF-811104-1(REV.1)
Implication of Spatial Averaging in Complex Terrain Wind Studies.
DE81024451 1087 PC **A02/MF A01**

CONF-811104-2
Categorization of Nocturnal Drainage Flows in the Anderson Creek Valley.
DE81024374 1086 PC **A02/MF A01**

CONF-811104-3
Overview, Current Status, and Future Plans for the DOE Atmospheric Studies in Complex Terrain (ASCOT) Program.
DE81024417 1086 PC **A02/MF A01**

CONF-811104-4
Modeling a Multiple Tracer Release Experiment During Nocturnal Drainage Flow in Complex Terrain.
DE81024414 1086 PC **A02/MF A01**

CONF-811104-5
Comparison of a Drainage Flow Model with the Data of Manins and Sawford.
DE81025366 1087 PC **A02/MF A01**

CONF-811104-6
Study of the Nocturnal Drainage Flow over a Sloping Plateau in North-Central New Mexico.
DE81028744 1087 PC **A02/MF A01**

CONF-811119-1
Disruption Scenarios for a Nuclear-Waste Repository on the Nevada Test Site.
DE81030844 1243 PC **A02/MF A01**

CONF-811119-2
Systems Studies of Waste Transportation.
DE81030840 1243 PC **A02/MF A01**

CONF-7804180-1
Hydrogeological and Geochemical Studies in the Perch Lake Basin. A Second Report of Progress.
AECL-6404 1157 PC **A13/MF A01**

CONF-7811105-2
SPH Homogeneization Method.
CEA-CONF-4492 1249 PC **A02/MF A01**

CONF-7811183-
Solar Energy for Livestock Production: Dairy, Swine, Poultry.
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CONF-7910166-14
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CONF-8006173-
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CONF-8009179-1
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DE81032008 1239 PC **A02/MF A01**

CONF-8009179-3
Swelling and Microstructure of HFIR Irradiated Austenitic Stainless Steels.
DE82000158 1192 PC **A02/MF A01**

CONF-8009179-4
Tensile Properties and Microstructure of Helium-Injected and Reactor-Irradiated V-20 Ti.
DE81032005 1192 PC **A02/MF A01**

CONF-8009179-6
Influence of Irradiation on the Tensile Properties of Austenitic Stainless Steel Weldments.
DE81032002 1221 PC **A02/MF A01**

-CONF--8104110--1
Heterogeneity and Expression of the Zein Storage Protein Gene Family of Maize.
DE81030735 1120 PC **A02/MF A01**

CONF-8106157-1
Relativistic Heavy-Ion Experiments.
DE81030544 1257 PC **A03/MF A01**

CONF-8106158-1
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DE81030128 1196 PC **A03/MF A01**

CONTRIB-534
Scavenging of Aerosol Particles by Precipitation.
PB82-134404 1213 PC **A02/MF A01**

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CONTROL SYSTEMS CENTRE-437
New Formulations for the Method of Inequalities,
PB82-135625 1199 PC **A03/MF A01**

CONTROL SYSTEMS CENTRE-438
Control of Building Engineering Services. Part 3: A Proposal for a Distributed Data Acquisition and Control (D-DAC) System,
PB82-134685 1092 PC **A03/MF A01**

CONTROL SYSTEMS CENTRE-439
Design Concepts for a Hierarchical Two Dimensional Multiprocessor Structure,
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CONTROL SYSTEMS CENTRE-440
Compensation of the Speed Governor of a Water Turbine by the Method of Inequalities,
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CONTROL SYSTEMS CENTRE-441
Computation of Abscissa of Stability by Repeated Use of the Routh Test,
PB82-134800 1199 PC **A02/MF A01**

CONTROL SYSTEMS CENTRE-442
Application of the Method of Inequalities to the Multivariable Control of Binary Distillation Columns,
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CONTROL SYSTEMS CENTRE-443
Control of Building Engineering Services. Part 4: Hardware Implementation of a Distributed Data Acquisition and Control (D-DAC) System,
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CONTROL SYSTEMS CENTRE-446
Simulation of a Two-Dimensional Multiprocessor Structure,
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CONTROL SYSTEMS CENTRE-447
Control of Building Engineering Services. Part 6: Survey of the Control Systems Centre's Building Engineering Services,
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SYCOL: Informal Language Specification,
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SYCOL: A High Level Language for Applications in Real Time Control Systems,
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Control of Building Engineering Services. Part 1: Background,
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Multivariable Pole Assignment Self Tuning Regulators,
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Interactive Maximum Likelihood Estimation,
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DE82000170 1103 PC **A03**/MF **A01**

DE82000173
Fuel-Cell Applied Research: Electrocatalysis and Materials. Quarterly Report, October 1, 1980-December 31, 1980.
DE82000173 1186 PC **A02**/MF **A01**

DE82000227
Peat Resource Evaluation: State of Maine. Report for the Quarter Ending August 1981.
DE82000227 1157 PC **A02**/MF **A01**

DE82000233
Infrared and Structural Analyses of Uranium Oxidation Products: Preliminary Results.
DE82000233 1151 PC **A04**/MF **A01**

DE82000243
Behavior of Alkali Metal-Acid Phosphates During Elevated Temperature Water Electrolysis.
DE82000243 1267 PC **A02**/MF **A01**

DE82000244
Analysis and Leak Tests of Wells for New Solution Mined Caverns at the Bryan Mound DOE-SPR Storage Site.
DE82000244 1267 PC **A04**/MF **A01**

DE82000252
Strategic Analysis of Conservation and Solar Energy Policies.
DE82000252 1181 PC **A03**/MF **A01**

DE82000267
Diffusion of Gases in Capillaries.
DE82000267 1253 PC **A06**/MF **A01**

DE82000338
Airborne gamma-Ray Spectrometer and Magnetometer Survey: Harrison Bay Quadrangle, Alaska. Final Report, Volume 1.
DE82000338 1161 PC **E06**/MF **A01**

DE82000347
Effects of Gas-Flow Pattern on Cavity Shape.
DE82000347 1161 PC **A02**/MF **A01**

DE82000388
Evaluation of Resource-Assessment Values and in-Situ Combustion Potential for the OH-4 and PA-3 Wells. Final Report.
DE82000388 1157 PC **A08**/MF **A01**

DE82000396
Regulation of Nucleic Acid and Protein Synthesis: A Background Study Related to the Biological Effects of Radiation. Final Report on Research Activities.
DE82000396 1120 PC **A02**/MF **A01**

DE82000408
Licensing Schedule for Away-from-Reactor (AFR) Spent Fuel Storage Facilities.
DE82000408 1244 PC **A03**/MF **A01**

DE82000415
Design and Assembly Considerations for Redox Cells and Stacks.
DE82000415 1186 PC **A02**/MF **A01**

DE82000419
Catalytic Combustion with Incompletely Vaporized Residual Fuel.
DE82000419 1265 PC **A04**/MF **A01**

DE82000420
Solvent Refined Coal Process: Operation of the Solvent Refined Coal Pilot Plant, Wilsonville, Alabama. First Quarter Report, January-March 1981.
DE82000420 1145 PC **A07**/MF **A01**

DE82000421
Sixteenth Progress Report of the Texas A and M University Nuclear Science Center, January 1, 1979-December 31, 1979.
DE82000421 1247 PC **A05**/MF **A01**

DE82000432
Fixed-Bed Gasification.
DE82000432 1148 PC **A03**/MF **A01**

DE82000433
Method for Estimating Technological Penetration Rates in Commercial Automobile Fleets.
DE82000433 1221 PC **A05**/MF **A01**

DE82000434
Aerial Radiological Survey of the United States Department of Energy's Pantex Plant and Surrounding Area Amarillo, Texas. Date of Survey: October 1979.
DE82000434 1246 PC **A02**/MF **A01**

NTIS ORDER/REPORT NUMBER INDEX

DE82000441
Proposed New Handbook for the Federal Emergency Management Agency: Radiation Safety in Shelters.
DE82000441 1230 PC **A07**/MF **A01**

DE82000452
Interactive Model to Assess Economics of Anaerobic Digestion on the Farm.
DE82000452 1267 PC **A03**/MF **A01**

DE82000453
Passive-Solar Retrofit Concepts.
DE82000453 1200 PC **A03**/MF **A01**

DE82000456
Passive-Solar Multi-Family Concepts.
DE82000456 1200 PC **A05**/MF **A01**

DE82000461
MASEC Industrial Fuel-Wood Program.
DE82000461 1268 PC **A03**/MF **A01**

DE82000468
Utility Rate Guide for SOLCOST Data Bank Cities.
DE82000468 1268 PC **A16**/MF **A01**

DE82000482
Investigation of Factors Affecting the in-Situ Combustion Retorting of Oil Shale. Final Report.
DE82000482 1161 PC **A08**/MF **A01**

DE82000483
Rate Guide for Residential No. 2 Heating Oil and Coal for SOLCOST Data Bank Cities.
DE82000483 1268 PC **A12**/MF **A01**

DE82000503
Monte Carlo Simulation of Molecular Flow in a Neutral-Beam Injector and Comparison with Experiment.
DE82000503 1239 PC **A03**/MF **A01**

DE82000505
Fossil Energy Program. Quarterly Progress Report for the Period Ending June 30, 1981.
DE82000505 1268 PC **A17**/MF **A01**

DE82000514
Air Pollution from Residential Woodburning Appliances: An Annotated Bibliography.
DE82000514 1209 PC **A02**/MF **A01**

DE82000517
Analysis of Data from Line-Source Thermal-Conductivity Measurements Taken in Situ in Dome Salt at the Avery Island Mine.
DE82000517 1157 PC **A05**/MF **A01**

DE82000522
Socioeconomic Assessment of Defense Waste Processing Facility Impacts in the Savannah River Plant Region.
DE82000522 1244 PC **A07**/MF **A01**

DE82000655
Point-Defect Sources and Sinks.
DE82000655 1252 PC **A02**/MF **A01**

DE82000688
Studies of Free Radicals by Ultraviolet Excimer Laser Photolysis. Progress Report, 1 April 1981-1 October 1981.
DE82000688 1151 PC **A03**/MF **A01**

DE82000697
Radiation Dose Rates from Commercial PWR and BWR Spent Fuel Elements.
DE82000697 1246 PC **A05**/MF **A01**

DE82000706
Federal Employee Occupational Safety and Health Briefing for Management Officials.
DE82000706 1138 PC **A04**/MF **A01**

DE82000708
Survey of Matrix Materials for Solidified Radioactive High-Level Waste.
DE82000708 1244 PC **A04**/MF **A01**

DE82000709
Western Gas Sands Project. Interim Economic Analysis of Natural Gas Production from Tight Formations in Selected Western Basins.
DE82000709 1162 PC **A04**/MF **A01**

DE82000808
Conversion of Municipal Solid Waste to Energy, Jacksonville, Florida, Phase I Report.
DE82000808 1268 PC **A11**/MF **A01**

DE82000816
Summary of the Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000816 1244 PC **A04**/MF **A01**

DE82000817
Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000817 1244 PC **A09**/MF **A01**

DE82000820
Development of Analytical Tools for the Punch Investigation of the Transuranic Package Transporter (TRUPACT).
DE82000820 1242 PC **A04**/MF **A01**

DE82001010
Laser-Induced-Fluorescence Studies of Fragment Ions: CH Exp + and CD exp + .
DE82001010 1151 PC **A06**/MF **A01**

DE82001158
Near-Term Improvements in Parabolic Troughs: An Economic and Performance Assessment.
DE82001158 1200 PC **A04**/MF **A01**

DE82900055
Seminar on Countermeasures for Pipe Cracking in BWRs.
DE82900055 1247 PC **A13**/MF **A01**

DE82900104
Planning Support Document for the EPRI Light-Water-Reactor Fuel-Rod-Performance Program.
DE82900104 1248 PC **A04**/MF **A01**

DELET-TR-78-2992-F
Surface Acoustic Wave Microwave Oscillator and Frequency Synthesizer.
AD-A107 539/9 1178 PC **A07**/MF **A01**

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Smoking and Health, A Report of the Surgeon General.
PB82-141300 1135 PC **A99**/MF **E04**

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PB82-139106 1142 PC **A06**/MF **A01**

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Methods for Evaluating Costs of Automated Hospital Information Systems.
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Bibliography of Soviet Laser Developments, Number 28, March - April 1977.
AD-A107 306/3 1255 PC **A05**/MF **A01**

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Nutrition Research--USSR,
AD-A107 335/2 1137 PC **A03**/MF **A01**

DLETA-20-51-79-39-1
An Assessment of Factors Affecting Employment of Temporary Foreign Labor in the East Coast Apple Harvest.
PB82-138678 1110 PC **A05**/MF **A01**

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DOD/DF-81/016D
Programming Support Library (PSL). Maintenance Manual. Volume I.
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DE82000709 1162 PC **A04**/MF **A01**

DOE/CS/20231-1
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DE82000808 1268 PC **A11**/MF **A01**

DOE/CS/30013-T3
Rate Guide for Residential No. 2 Heating Oil and Coal for SOLCOST Data Bank Cities.
DE82000483 1268 PC **A12**/MF **A01**

DOE/CS/30013-T4
Utility Rate Guide for SOLCOST Data Bank Cities.
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DOE/CS/30375-T1
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DE81030942 1155 PC **A03**/MF **A01**

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DE82000060 1151 PC **A02**/MF **A01**

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Phonons in Alkali Graphite Intercalation Compounds.
DE82000059 1151 PC **A02**/MF **A01**

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Lattice Dynamics of Graphite Intercalation Compounds: Modelled by the Phonon Dispersion of Linear Chains.
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DOE/ET/13383-T1

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Reducing Conventive Losses from Cover Glazings of Solar-Thermal Collectors.
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DOE/ET/27232-T4

Utilization of Geothermal Energy in the Mining and Processing of Tungsten Ore. 2ND Quarterly Report.
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Formation Evaluation in Liquid-Dominated Geothermal Reservoirs.
DOE/ET/28384-T1 1162 PC A06/MF A01

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Alaska: A Guide to Geothermal Energy Development.
DOE/ET/28476-T2 1162 PC A06/MF A01

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DE82000396 1120 PC A02/MF A01

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Staphylococcus Aureus Protease: A Probe of Exposed, Non-Basic Histone Sequences in Nucleosomes.
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DOE/FC/14690-T1

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DE82000093 1186 PC A04/MF A01

DOE/LC/10787-80

Meteorological and Climatological Investigation: Review of January-June 1980 Investigative Period.
DE81030740 1087 PC A05/MF A01

DOE/LC/10787-80-APP.D-V.1

Meteorological and Climatological Investigation: Review of January-June 1980 Investigative Report.
DE81030741 1087 PC A08/MF A01

DOE/MA-0025

Autopreps Data Base for Cost-Reimbursement Support Services or Nonnuclear R and D Procurements.
DE82000045 1090 PC A09/MF A01

DOE/MA-0035

Federal Employee Occupational Safety and Health Briefing for Management Officials.
DE82000706 1138 PC A04/MF A01

DOE/MC/16823-T1

Integration, Interpretation and Evaluation of Results in a Multi-Well Interference Test Project. Quarterly Financial Summary and Monthly Technical Report.
DE81030377 1161 PC A04/MF A01

DOE/METC/SP-184

Fixed-Bed Gasification.
DE82000432 1146 PC A03/MF A01

DOE/NASA/0051-2

Conceptual Design Study of Potential Early Commercial MHD Powerplant. Final Report of Task 2 Results.
DE81030882 1185 PC A12/MF A01

DOE/NASA/0152-1

Catalytic Combustion with Incompletely Vaporized Residual Fuel.
DE82000419 1265 PC A04/MF A01

DOE/NASA/0176-81/3

Survey on Aging on Electrodes and Electrocatalysts in Phosphoric Acid Fuel Cells.
N82-11545/2 1186 PC A04/MF A01

DOE/NASA/0227-1

Preliminary Study of Temperature Measurement Techniques for Stirling Engine Reciprocating Seals.
N82-11466/1 1271 PC A05/MF A01

DOE/NASA/12726-10

Design and Assembly Considerations for Redox Cells and Stacks.
DE82000415 1186 PC A02/MF A01

DOE/NASA/51040/33

Jet Impingement Heat Transfer Enhancement for the GPU-3 Stirling Engine.
N82-11993/4 1271 PC A03/MF A01

DOE/OR/06102-T1

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DE81025021 1242 PC A05/MF A01

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DE81030967 1161 PC A02/MF A01

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DOE/RA/11025-T1(V.1)

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DOE/RA/11025-T1(V.1) 1186 PC A11/MF A01

DOE/SF/01123-T57

Executive Summary: Brayton Isotope Power System.
DE81027473 1249 PC A03/MF A01

DOE/SF/01435-T6

Engineering Design Study.
DE81025940 1246 PC A02/MF A01

DOE/SF/70030-T45

Blowdown Transients and Implication for Leak Protection Shutdown Strategy.
DE81027453 1247 PC A03/MF A01

DOE/SF/71031-T25

FFTF MOTA: Design Thermal and Stress Overcheck Analyses.
DE81027367 1247 PC A02/MF A01

DOE/TIC-11491

Hydrologic Study of the Unsaturated Zone Adjacent to a Radioactive-Waste Disposal Site at the Savannah River Plant, Aiken, South Carolina.
DE81031984 1159 PC A07/MF A01

DOE/TIC-11494

Study of Protein Modifications Induced by Phorbol Ester Tumor Promoters in Mouse Skin.
DE81031985 1145 PC A06/MF A01

DOE/UMT-0106

Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000817 1244 PC A09/MF A01

DOE/UMT-0106S

Summary of the Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000816 1244 PC A04/MF A01

DOT-HS-805-975

Profiles of Automotive Suppliers Industries-Engineered Mechanical Components and Systems: Volume I, Text.
PB82-129503 1098 PC A19/MF A01

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Profiles of Automotive Suppliers Industries-Engineered Mechanical Components and Systems: Volume II, Appendices.
PB82-129511 1098 PC A09/MF A01

DOT-P-50-81-92

Potential Fuel Conservation from Regulatory Reform of the Trucking Industry.
PB82-130907 1183 PC A06/MF A01

DOT/RSPA/DPB/25-81/16

Non-Contacting Suspension and Propulsion Systems for Transportation Applications,
PB82-135591 1221 PC A09/MF A01

DOT/RSPA/DPB-50/80/23

Techniques for Analyzing the Performance of Rural Transit Systems. Volume I.
PB82-106436 1221 PC A06/MF A01

DOT/RSPA/DPB-50/81/26

Department of Transportation Awards to Academic Institutions in Fiscal Year 1980,
PB82-141508 1216 PC A03/MF A01

DOT-TSC-NHTSA-81-21-1

Profiles of Automotive Suppliers Industries-Engineered Mechanical Components and Systems: Volume I, Text.
PB82-129503 1098 PC A19/MF A01

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Profiles of Automotive Suppliers Industries-Engineered Mechanical Components and Systems: Volume II, Appendices.
PB82-129511 1098 PC A09/MF A01

DOT-7932

Improvement of Device (CMD) for Monitoring the Consolidation of Plastic Concrete.
PB82-132390 1219 PC A04/MF A01

DP-MS-81-44

Leaching of Nuclear-Waste Forms.
DE81030490 1243 PC A02/MF A01

DP-1582

Licensing Schedule for Away-from-Reactor (AFR) Spent Fuel Storage Facilities.
DE82000408 1244 PC A03/MF A01

DP-1598

In-Situ High-Resolution gamma-Spectrometric Survey of Burial Ground-Monitoring Wells.
DE81030827 1245 PC A03/MF A01

DPSPU-80-30-9

High-Current Resistance Welding of Nuclear-Waste Containers.
DE81030403 1243 PC A02/MF A01

DPSPU-80-30-13

Operating-Procedure System at Savannah River Plant.
DE81030405 1090 PC A02/MF A01

DPSTD-80-38

Preliminary Technical Data Summary for the Defense Waste Processing Facility, Stage 1.
DE82000035 1243 PC A10/MF A01

DREV-R-4198/81

Image Segmentation with Color and Texture,
AD-A107 479/8 1173 PC A03/MF A01

DREV-R-4201/81

A 10.6 micrometer Amplitude Modulated Telemeter Laser with Nonlinear Postdetection: Study of a Single Laser System--Transiation.
AD-A107 475/6 1256 PC A04/MF A01

DRIC-BR-64523

'Pseudo', A Macro-Based High Level Language for the PDP-11,
AD-A107 168/7 1172 PC A04/MF A01

DRIC-BR-77779

Applications of the Microscan 9 Microanalyser.
AD-A106 969/9 1148 PC A02/MF A01

DRIC-BR-78582

The Design of a 'Jet Catcher'.
AD-A106 968/1 1253 PC A02/MF A01

DRIC-BR-79976

A Basic Computer Program to Calculate Moisture Content in Resins and Fibre Reinforced Resin Composites.
AD-A106 970/7 1194 PC A02/MF A01

DRIC-BR-80019

A True Air Speed Sensor for Miniature Unmanned Aircraft.

AD-A106 967/3 1079 PC **A02**/MF **A01**

DRSMI/RD-81-16
Addition of Data Feature for FEASIL. Supplement.
AD-A106 992/1 1171 PC **A02**/MF **A01**

DRSMI-RE-81-5-TR
Signal Analysis Van Hardware Operation General Description. Volume 1.
AD-A106 948/3 1238 PC **A03**/MF **A01**

DRSMI-RE-81-19-TR
Active RF Seeker Analysis for Land Combat Seekers.
AD-A106 947/5 1238 PC **A04**/MF **A01**

DRSMI/RG-CR-81-4
Automatic Handoff of Multiple Targets.
AD-A107 490/5 1236 PC **A08**/MF **A01**

DRXTH-TE-CR-80086
Identification or Development of Chemical Analysis Methods for Plants and Animal Tissues.
AD-A107 346/9 1144 PC **A14**/MF **A01**

DTNSRDC/PAS-81/14
Active Superconductive Generator Development 400-Horsepower Generator Design.
AD-A107 513/4 1185 PC **A06**/MF **A01**

DTNSRDC/SME-80/212
Fractionation of Diesel Fuel from Petroleum and Paraho Shale Oils.
AD-A107 042/4 1266 PC **A02**/MF **A01**

DTNSRDC/SME-81/57
Dynamic J sub I-R Curve Testing of HY-130 Steel.
AD-A107 040/8 1191 PC **A03**/MF **A01**

DTNSRDC-81/073
The Dynamic Design-Analysis Method (DDAM) in NASTRAN.
AD-A107 074/7 1262 PC **A03**/MF **A01**

E81-10114
Evaluation of Gravimetric Ground Truth Soil Moisture Data Collected for the Agricultural Soil Moisture Experiment, 1978 Colby, Kansas, Aircraft Mission.
N81-29494/4 1169 PC **A14**/MF **A01**

E81-10160
Development of Advanced Acreage Estimation Methods.
N81-29495/1 1156 PC **A07**/MF **A01**

E81-10161
Evaluation of Multiband, Multitemporal, and Transformed Landsat Mss Data for Land Cover Area Estimation.
N81-29496/9 1080 PC **A02**/MF **A01**

E81-10162
An Analysis of Haze Effects on Landsat Multispectral Scanner Data.
N81-29497/7 1080 PC **A03**/MF **A01**

E81-10182
The Multicategory Case of the Sequential Bayesian Pixel Selection and Estimation Procedure.
N81-29498/5 1198 PC **A02**/MF **A01**

E81-10183
Nationwide Forestry Applications Program. Analysis of Forest Classification Accuracy.
N81-29499/3 1081 PC **A05**/MF **A01**

E81-10184
Soil Moisture Inferences from Thermal Infrared Measurements of Vegetation Temperatures.
N81-29500/8 1169 PC **A02**/MF **A01**

E81-10185
Conversion of Spu-Universal Disk File to Jsc-Universal Tape Storage: Convrt User's Guide.
N81-29501/6 1174 PC **A02**/MF **A01**

E81-10186
Maximum Likelihood Clustering with Dependent Feature Trees.
N81-29502/4 1198 PC **A04**/MF **A01**

E81-10189
New Output Improvements for Classy.
N81-29503/2 1080 PC **A03**/MF **A01**

E81-10190
Users Manual for the US Baseline Corn and Soybean Segment Classification Procedure.
N81-29504/0 1080 PC **A12**/MF **A01**

E81-10191
The Environmental Vegetation Index: A Tool Potentially Useful for Arid Land Management.
N81-29505/7 1081 PC **A02**/MF **A01**

E81-10192
Characteristics, of Tiros, Goes, Dmsp and Landsat Systems.
N81-29506/5 1272 PC **A02**/MF **A01**

E81-10193
Descriptive and Sensitivity Analyses of Watbali: A Dynamic Soil Water Model.
N81-29507/3 1170 PC **A05**/MF **A01**

E81-10197
Evaluation of Spring Wheat and Barley Crop Calender Models for the 1979 Crop Year.
N81-29508/1 1081 PC **A03**/MF **A01**

E81-10198
Computer Program Documentation User Information for the Rso-Tape Print Program (Rsoprnt).
N81-29509/9 1174 PC **A02**/MF **A01**

E81-10199
Estimation of Proportions in Mixed Pixels Through Their Region Characterization.
N81-29510/7 1198 PC **A03**/MF **A01**

E81-10200
Evaluation of Large Area Crop Estimation Techniques Using Landsat and Ground-Derived Data.
N81-29511/5 1081 PC **A06**/MF **A01**

E-621
Lewis Research Center's Coal-Fired, Pressurized, Fluidized-Bed Reactor Test Facility.
N82-11397/8 1265 PC **A03**/MF **A01**

E-668
Selected Bibliography of Naca-NASA Aircraft Icing Publications.
N82-11053/7 1078 PC **E15**/MF **A01**

E-709
Fabrication and Wear Test of a Continuous Fiber/Particulate Composite Total Surface Hip Replacement.
N82-11211/1 1140 PC **A03**/MF **A01**

E-922
Solar Cell Development for the Power Extension Package.
N82-11551/0 1187 PC **A02**/MF **A01**

E-993
Universal Binding Energy Relations in Metallic Adhesion.
N82-11183/2 1189 PC **A02**/MF **A01**

E-995
Integrated Analysis of Engine.
N82-11491/9 1078 PC **A02**/MF **A01**

E-999
Trends in High Temperature Gas Turbine Materials.
N82-11182/4 1193 PC **A02**/MF **A01**

E-1003
Voltage Gradients in Solar Array Cavities as Possible Breakdown Sites in Spacecraft-Charging-Induced Discharges.
N82-11107/1 1186 PC **A02**/MF **A01**

E-1024
Testing of a Spacecraft Model in a Combined Environment Simulator.
N82-11106/3 1273 PC **A02**/MF **A01**

E-1027
A Summary of V/STOL Inlet Analysis Methods.
N82-11043/8 1077 PC **A02**/MF **A01**

E-1031
Low Speed Testing of the Inlets Designed for a Tamden-Fan V/STOL Nacelle.
N82-11042/0 1077 PC **A02**/MF **A01**

E-1045
Novel Improved PMR Polyimides.
N82-11117/0 1190 PC **A02**/MF **A01**

E-1077
Failure Analysis of a Tool Steel Torque Shaft.
N82-11184/0 1193 PC **A02**/MF **A01**

EA-80-U-051
Aids to Navigation Principal Findings on the CAORF Experiment. The Performance of Visual Aids to Navigation as Evaluated by Simulation.
AD-A107 045/7 1236 PC **A08**/MF **A01**

EA-80-U-86
Simulator Evaluation of Electronic Radio Aids to Navigation Displays, the RA-1 Experiment.
AD-A106 941/8 1236 PC **A09**/MF **A01**

EA-80-U-88
Simulator Evaluation of Electronic Radio Aids to Navigation Displays--The Miniexperiment.
AD-A107 072/1 1236 PC **A06**/MF **A01**

EDA-81-0129
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EE-77-CAN03
Differential PCM Systems,
PB82-132804 1178 PC **A03**/MF **A01**

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New Measurement Strategy for in Situ Testing of Wall Thermal Performance.
LBL-8822 1226 PC **A03**/MF **A01**

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DE82000434 1246 PC **A02**/MF **A01**

EPA/AA/CTAB/PA/81-15
Nitrosamines and Other Hazardous Emissions from Engine Crankcases.
PB82-127960 1210 PC **A02**/MF **A01**

EPA-AA-CTAB/PA/81-18
Current Status of EPA Office of Mobile Source Air Pollution Control Characterization Projects: Summary.
PB82-105909 1269 PC **A04**/MF **A01**

EPA-AA-TEB-81-25
Directory of Information for Dynamometer Testing of 1979-1981 Light Duty Motor Vehicles,
PB82-106873 1221 PC **A04**/MF **A01**

EPA-AA-TEB-81-27
Final Results of the 'One Week Follow-Up' with Participants during the FY79 and FY80 Emission Factor Testing Programs.
PB82-139494 1222 PC **A03**/MF **A01**

EPA-450/2-81-003
Permit Fee Guideline.
PB82-107871 1210 PC **A03**/MF **A01**

EPA-450/4-81-030
Questions and Responses at the 1981 Workshops on Procedures to Demonstrate Attainment of the NAAQS (National Ambient Air Quality Standards) for Ozone in the 1982 SIPs (State Implementation Plans).
PB82-107863 1210 PC **A03**/MF **A01**

EPA-540/RS-81-009
Pesticide Registration Standard: Isopropalin.
PB82-131293 1136 PC **A07**/MF **A01**

EPA-540/RS-81-014
Dialifor (O, O-diethyl S-(2-chloro-1-phthalimidoethyl) phosphorodithioate): Pesticide Registration Standard.
PB82-133638 1145 PC **A08**/MF **A01**

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PB82-136979 1220 PC **A19**/MF **A01**

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PB82-134081 1226 PC **A06**/MF **A01**

EPA-560/2-81-006
Chemical Technology and Economics in Environmental Perspective. Task VI - A Survey of Plasticizers: Epoxies, Linear Polyesters, and Trimellitates.
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EPA-600/2-80-077E
Treatability Studies of Pesticide Manufacturing Wastewaters: Ethylenebisdithiocarbamate Fungicides.
PB82-107566 1210 PC **A05**/MF **A01**

EPA-600/2-80-197
Dioxins.
PB82-136847 1215 PC **A16**/MF **A01**

EPA-600/2-81-246
Survey of On-Going and Completed Remedial Action Projects.
PB82-134115 1213 PC **A11**/MF **A01**

EPA-600/4-80-025
Performance Tests for the Evaluation of Computerized Gas Chromatography/Mass Spectrometry Equipment and Laboratories,
PB82-137662 1229 PC **A03**/MF **A01**

EPA-600/4-81-076
Initial Toxicological Assessment of Ambush, Bolero, Bux, Dursban, Fentrifanil, Larvin, and Pydrin: Static Acute Toxicity Tests with Selected Estuarine Algae, Invertebrates, and Fish.
PB82-137654 1145 PC **A02**/MF **A01**

EPA-600/7-81-036
Evaluation of Existing Marine Intertidal and Shallow Subtidal Biologic Data,
PB82-134065 1155 PC **E10**/MF **A01**

EPA-600/7-81-089
Circulation and Trajectory Calculations in the Eastern Strait of Juan de Fuca Using a CODAR System,
PB82-134099 1156 PC **A03**/MF **A01**

EPA-600/7-81-136
On-Site GC/MS Analysis of Chapman Gasification Separator Liquor.
PB82-107285 1152 PC **A03**/MF **A01**

EPA-600/7-81-156
Marine Bird Populations of the Strait of Juan de Fuca, Strait of Georgia and Adjacent Waters in 1978 and 1979,
PB82-132622 1155 PC **E10**/MF **A01**

EPA-600/8-80-004
Controlling Nitrogen Oxides.
PB82-139049 1215 PC **A03**/MF **A01**

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PB82-137621 1136 PC A02/MF A01

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PB82-132457 1121 PC A02/MF A01

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A New Species of 'Stenonema' (Ephemeroptera: Heptageniidae) from Eastern North America.
PB82-132465 1121 PC A02/MF A01

EPA-600/J-80-014
Dopamine Depletion Slows Retinal Transmission.
PB82-127432 1142 PC A02/MF A01

EPA-600/J-80-044
Inductively Coupled Plasma-Atomic Emission Spectrometric Analysis of Environmental Samples Using Ultrasonic Nebulization.
PB82-118209 1229 PC A02/MF A01

EPA-600/J-80-355
Scavenging of Aerosol Particles by Precipitation.
PB82-134404 1213 PC A02/MF A01

EPA-600/J-80-358
Aerosol Formation in Urban Plumes.
PB82-132580 1212 Not available NTIS

EPA-600/J-80-359
Observations of the Modification of Cloud Condensation Nuclei in Wave Clouds.
PB82-132564 1087 PC A02/MF A01

EPA-600/J-80-360
Removing Trihalomethanes from Drinking Water - An Overview of Treatment Techniques.
PB82-132572 1212 PC A02/MF A01

EPA-600/J-81-026
Aerosol Sampling Inlets and Inhalable Particles.
PB82-132473 1212 PC A02/MF A01

EPA-600/J-81-069
Marine and Estuarine Pollution.
PB82-128174 1136 PC A03/MF A01

EPA-600/J-81-128
Influence of Drilling Muds on the Primary Chemosensory Neurons in Walking Legs of the Lobster, 'Homarus americanus'.
PB82-128190 1136 PC A02/MF A01

EPA-600/J-81-337
Methyl Parathion Persistence in Soil Following Simulated Spillage.
PB82-127549 1170 PC A02/MF A01

EPA-600/J-81-345
Effect of Fluctuating Exposures on the Acute Toxicity of Ammonia to Rainbow Trout (Salmo gairdneri) and Cutthroat Trout (S. clarki).
PB82-128158 1145 PC A02/MF A01

EPA-600/J-81-347
Effects of Pollution on Freshwater Fish.
PB82-127358 1136 PC A03/MF A01

EPA-600/J-81-348
Effects of Acid Precipitation in North America.
PB82-128117 1136 PC A02/MF A01

EPA-600/J-81-383
Tethered Balloon Sampling Systems for Monitoring Air Pollution.
PB82-126319 1210 PC A02/MF A01

EPA-600/J-81-402
Atmospheric Benzene Depletion by Soil Microorganisms.
PB82-126293 1170 PC A02/MF A01

EPA-600/J-81-481
Effects of Synfuel Use.
PB82-132432 1212 PC A02/MF A01

EPA-600/J-81-482
Improvement of Hot-Side Precipitator Performance with Sodium Conditioning--An Interim Report.
PB82-134107 1213 PC A02/MF A01

EPA-904/9-81-082
Tallahassee-Leon County Wastewater Management, Tallahassee, Leon County, Florida.
PB82-106428 1209 PC A10/MF A01

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PB82-108838 1210 PC A09/MF A01

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EPRI-NP-1000(V.3) 1247 PC A09/MF A01

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ERADCOM/ASL-DR-1203A
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19315AT MLRS, Missile Numbers V13-002, V15-003, Round Numbers V-185/AT-9, V-186/AT-10, 18 August 1981.
AD-A107 351/9 1086 PC A03/MF A01

ERADCOM/ASL-TR-0092
Effect of Hail, Snow, and Melting Hydrometeors on Millimeter Radio Waves.
AD-A107 429/3 1264 PC A04/MF A01

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The Effect of Ionospheric Variability on the Accuracy of High Frequency Position Location.
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PB82-133729 1220 PC A04/MF A01

ERT-P-7505-F
An Evaluation of the Spatial Resolution of Soil Moisture Information.
N82-11513/0 1170 PC A05/MF A01

ERT-TR-A345-T1
Variations in Atmospheric Angular Momentum.
N82-11690/6 1085 PC A03/MF A01

ESA-SP-143
Radiation Balances and the Solar Constant.
N82-12016/3 1085 PC A02/MF A01

ESD-TR-81-241
Digital Filters for Infrared Target Acquisition Sensors.
AD-A107 061/4 1236 PC A02/MF A01

ESD-TR-81-242
Electromagnetic Long-Line Effects in Surface Wave Convolvers.
AD-A107 060/6 1252 PC A02/MF A01

ESD-TR-81-243
The Effect of Acoustic Dispersion and Attenuation on SAW Convolver Performance.
AD-A107 057/2 1178 PC A02/MF A01

ESD-TR-81-244
Communications through a Randomly Dispersive Incoherent Optical Channel.
AD-A107 052/3 1233 PC A02/MF A01

ESD-TR-81-245
Simulation and Development of a PCSFSK Demodulator.
AD-A107 055/6 1233 PC A02/MF A01

ESD-TR-81-246
Some Factors Affecting Angular Resolution in an Adaptive Antenna.
AD-A107 058/0 1178 PC A02/MF A01

ESD-TR-81-247
Technology Assessment for Future EHF MILSATCOM Systems.
AD-A107 059/8 1233 PC A02/MF A01

ESD-TR-81-248
Liquid Phase Epitaxial Growth of Hg1-xCdxTe from Te-Rich Solutions.
AD-A107 054/9 1252 PC A02/MF A01

ESD-TR-81-249
Bistatic Scattering Reflection Asymmetry, Polarization Reversal Asymmetry, and Polarization Reversal Reflection Symmetry.
AD-A107 065/5 1238 PC A02/MF A01

ESD-TR-81-260
The Spectral Envelope Estimation Vocoder.
AD-A107 063/0 1233 PC A02/MF A01

ESD-TR-81-261
A 31-GHz Monolithic GaAs Mixer/Preamplifier Circuit for Receiver Applications.
AD-A107 062/2 1178 PC A02/MF A01

ESD-TR-81-262
Liquid-Phase Epitaxial Growth of InP and InGaAsP Alloys.
AD-A107 233/9 1252 PC A02/MF A01

ESD-TR-81-263
Liquid-Encapsulated Czochralski Growth of InP Crystals.
AD-A107 051/5 1252 PC A02/MF A01

ESD-TR-81-264
Vapor-Phase Epitaxy of GaInAsP and InP.
AD-A107 053/1 1252 PC A02/MF A01

ESD-TR-81-265
Circular and Extended Circular Harmonic Transforms and Their Relevance to Image Reconstruction from Line Integrals.
AD-A107 050/7 1196 PC A02/MF A01

ESD-TR-81-266
GaAs Shallow-Homojunction Solar Cells on Ge-Coated Si Substrates.
AD-A107 056/4 1184 PC A02/MF A01

ESD-TR-81-267
Transient Annealing of Arsenic-Implanted Silicon Using a Graphite Strip Heater.
AD-A107 230/5 1222 PC A02/MF A01

ESD-TR-81-268
MNOS/CCD Nonvolatile Analog Memory.
AD-A107 229/7 1172 PC A02/MF A01

ESD-TR-81-269
Sputtered Films for Wavelength-Selective Applications.
AD-A107 232/1 1200 PC A02/MF A01

ESD-TR-81-270
Performance Advantage of Complex LMS Controlling Narrow-Band Adaptive Arrays.
AD-A107 231/3 1178 PC A02/MF A01

ESD-78-MSFC-2174
Investigation of Direct Solar-to-Microwave Energy Conversion Techniques.
N82-11544/5 1186 PC A06/MF A01

ETL-R026
High-Speed Laser Platemaking from Digital Data for the Defense Mapping Agency.
AD-A107 380/8 1156 PC A02/MF A01

ETL-0254
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EUR-6864-EN
Description and Performance of an Active Solar Cooling System, Using a LiBr-H2O Absorption Machine.
PB82-139031 1202 PC E05/MF E05

EUR-6886-EN
Analysis of Complete Logical Structures in System Reliability Assessment.
PB82-138363 1242 PC E05/MF E05

EUR-6965-DE
Hybrid Processes for the Production of Hydrogen (Hybridprozesse zur Wasserstofferzeugung).
PB82-139452 1269 PC E09/MF E09

EUR-6991-EN
Determination of Skimmed-Milk Powder in Feedingstuffs: Study of Some Interferences.
PB82-137852 1137 PC E03/MF E03

EUR-7006-DE
Heat Recovery Installations with Reflux Heat Pipes as Basic Components (Waermerueckgewinnungsanlagen mit Reflux-Waermerohren als Bauelemente).
PB82-140146 1202 PC E07/MF E07

EUR-7011-EN
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EUR-7011-EN 1085 PC A13/MF A01

EUR-7031-EN
RSM Development for Nuclear Safety Analysis. A Test Problem.
PB82-138389 1242 PC E03/MF E03

EUR-7062-EN
Feasibility of the Connection of Wells in Hot Dry Rocks by Means of Hydraulic Fracturing Techniques: Experimental Research Dealing with Three-Dimensional Crack Interaction, Largely Utilizing Photoelastic Techniques.
PB82-140138 1167 PC E06/MF E06

EUR-7063-EN
Development of a Directly-Fired Heat Pump for Domestic and Light Commercial Application.
PB82-137191 1202 PC E10/MF E10

EUR-7151-EN
The Dutch Geologic Radioactive Waste Disposal Project.
PB82-138397 1245 PC E09/MF E09

NTIS ORDER/REPORT NUMBER INDEX

EUR-7165-FR
Experimental Study of the Combustion of Low-Grade Calorific Material with the Aim of Assessing its Utility Value (Etude Experimentale de la Combustion Des Matieres a Faible Pouvoir Calorifique en Vue de Leur Valorisation).
PB82-139460 1269 PC **E05**/MF **E05**

EUR-7175-EN
The Certification of Polycyclic Aromatic Hydrocarbon Materials (PAH). Part II: The Six Methylchrysene Isomers (BRC Reference Materials No. 77, 78, 79, 80, 81 and 82).
PB82-138355 1153 PC **E03**/MF **E03**

EUR-7266-EN
Thermal Energy Storage Systems. Part I.
PB82-137589 1188 PC **E06**/MF **E06**

F78-11-REV-A
Development of the Coastal Zone Color Scanner for Nimbus 7. Volume 1: Mission Objectives and Instrument Description.
N82-11511/4 1228 PC **A05**/MF **A01**

FAA-CT-81-59
High-Speed Rotary Printing Device for Air Traffic Control Applications: A Preliminary Evaluation.
AD-A107 325/3 1237 PC **A02**/MF **A01**

FAA-CT-81-61
Microwave Landing System Flare Subsystem Test.
AD-A107 327/9 1237 PC **A03**/MF **A01**

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FAA/EE-81-8
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AD-A107 320/4 1205 PC **A02**/MF **A01**

FAA/RD-81/38/1
Aircraft Alerting Systems Standardization Study. Volume I. Candidate System Validation and Time-Critical Display Evaluation.
AD-A107 225/5 1079 PC **A06**/MF **A01**

FAA/RD-81/73
High-Speed Rotary Printing Device for Air Traffic Control Applications: A Preliminary Evaluation.
AD-A107 325/3 1237 PC **A02**/MF **A01**

FAR-211-GP
Saudi Perceptions of the International Environment.
AD-A106 927/7 1102 PC **A02**/MF **A01**

FAR-212-GP
Pakistan's Foreign Relations.
AD-A107 113/3 1102 PC **A02**/MF **A01**

FAR-213-GP
Saudi Arabia: The Flexibility of Islamic Fundamentalism.
AD-A106 930/1 1102 PC **A02**/MF **A01**

FBDU-360-19
Engineering Assessment of Inactive Uranium Mill Tailings, Riverton Site, Riverton, Wyoming.
DE82000817 1244 PC **A09**/MF **A01**

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DE82000816 1244 PC **A04**/MF **A01**

FCTC-81-104
Harris Corporation, Harris 1600-02 Model II, Harris Interactive COBOL, Version 107.1 (Validation).
PB82-134412 1175 PC **E03**/MF **A01**

FDA/BD-82/3
Deviance Within a Model of Superior Formulary Performance.
PB82-134420 1141 PC **A07**/MF **A01**

FDA/DF-81/004
Approved Prescription Drug Products with Therapeutic Equivalence Evaluations.
PB82-129164 1141 CP **T02**

FDRL-81-7
Aeroacoustic Theory for Noncompact Wing-Gust Interaction.
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FEDERAL AID CASE STUDIES SER PAPER-10
Case Studies of the Impact of Federal Aid on Major Cities: City of Cleveland.
PB82-131558 1114 PC **A07**/MF **A01**

FFA-134
A Two-Dimensional Study of the Maximum Power That Can Be Obtained from a Wind Turbine in a Wind Shear Layer.
PB82-136987 1187 PC **A04**/MF **A01**

FHWA/MI/RD-81-02
The Resilient and Plastic Characteristics of Michigan Subgrade Soils and Their Soil Support Values.
PB82-109570 1170 PC **A16**/MF **A01**

FHWA/MS-80/070
Wave Forces on Causeway-Type Coastal Bridges: Effects of Angle of Wave Incidence and Cross-Section Shape.
PB82-131657 1211 PC **A12**/MF **A01**

FHWA/NC-81/004
Mixing Water and Maturity of Hardened Concrete Using Scanning Electron Microscope Techniques. Part One.
PB82-133729 1220 PC **A04**/MF **A01**

FHWA/NY-77-RR45
Development of a Test Trailer for High-Volume Skid-Resistance Surveys.
PB82-135872 1214 PC **A04**/MF **A01**

FHWA/OK-80/001
Polymer Impregnated Concrete and Polymer Concrete Overlays. Volume I.
PB82-133661 1220 PC **A06**/MF **A01**

FHWA/OK-80/002
Polymer Concrete Patching. Volume II.
PB82-133679 1220 PC **A06**/MF **A01**

FHWA/OK-80/003
Polymer Concrete Patching. Volume III. User's Manual.
PB82-133687 1220 PC **A03**/MF **A01**

FHWA/PL-81/017
Methods for Allocating Highway Costs.
PB82-130501 1211 PC **A05**/MF **A01**

FHWA/RD-80/069
Epoxy Thermoplastic Pavement Marking Material: Specification and Testing.
PB82-135914 1214 PC **A06**/MF **A01**

FHWA/RD-80/086
Integrated Traffic Simulation Model - Phase I. Volume 1: Executive Summary.
PB82-139155 1215 PC **A03**/MF **A01**

FHWA/RD-80/087
Integrated Traffic Simulation Model - Phase I. Volume 2: Design of the TRAF Operating System (TDS).
PB82-139163 1215 PC **A05**/MF **A01**

FHWA/RD-80/088
Integrated Traffic Simulation Model - Phase I. Volume 3: TRAF Operating System Users Guide.
PB82-139171 1215 PC **A06**/MF **A01**

FHWA/RD-80/089
Integrated Traffic Simulation Model - Phase I. Volume 4: Revisions to UTCS-1 Traffic Simulation Model to Enhance Operational Effectiveness.
PB82-139189 1216 PC **A04**/MF **A01**

FHWA/RD-80/100
Traffic Diversion Software Applications Summary.
PB82-131673 1212 PC **A04**/MF **A01**

FHWA/RD-80/162
Alternative Sign Sequences for Work Zones on Rural Highways. Executive Summary.
PB82-132812 1213 PC **A02**/MF **A01**

FHWA/RD-81/003
Field Study of Pile Group Action. Appendix A.
PB82-137639 1215 PC **A06**/MF **A01**

FHWA/RD-81/004
Field Study of Pile Group Action. Appendix B.
PB82-137647 1215 PC **A05**/MF **A01**

FHWA/RD-81/032
Flexible Pavement Overlay Design Procedures. Volume 1. Evaluation and Modification of the Design Methods.
PB82-136672 1215 PC **A09**/MF **A01**

FHWA/RD-81/033
Flexible Pavement Overlay Design Procedures. Volume 2. User Manual.
PB82-136680 1215 PC **A07**/MF **A01**

FHWA/RD-81/051
Analyses, Experimental Studies, and Evaluations of Control Measures for Air Flow and Air Quality on and Near Highways. Volume I: Experimental Studies, Analyses, and Model Development.
PB82-133604 1213 PC **A12**/MF **A01**

FHWA/RD-81/117
Improvement of Device (CMD) for Monitoring the Consolidation of Plastic Concrete.
PB82-132390 1219 PC **A04**/MF **A01**

FNP-560-82-02
Historic Resource Study and Historic Structure Report Ninety Six: A Historical Narrative.
PB82-140351 1104 PC **A13**/MF **A01**

FOA-C-30171-EL
Laser Induced Fluoroescence from Algae: Results of a Ship-Borne Field Test.
N82-11758/1 1121 PC **A03**/MF **A01**

FOUNDATION PAPER-528
Value Theory without Efficiency.
AD-A107 085/3 1199 Not available NTIS

FPCD-82-1
Civil Service Reform After Two Years: Some Initial Problems Resolved but Serious Concerns Remain.
PB82-134131 1110 PC **A05**/MF **A01**

FPL-FSRN-0244
Analysis of Continuous Beams with Joint Slip.
AD-A107 112/5 1221 PC **A02**/MF **A01**

FR-10066
Processing of Silicon Solar Cells by Ion Implantation and Laser Annealing.
N82-11546/0 1186 PC **A05**/MF **A01**

FRA/ORD-81/25.I
Railroad Yard Simulation Model: Description and Computer Program Users' Manual.
PB82-138686 1222 PC **A05**/MF **A01**

FRI-UW-8116
Juvenile Salmonid and Baitfish Distribution, Abundance and Prey Resources in Selected Areas of Grays Harbor, Washington.
AD-A106 984/8 1155 PC **A11**/MF **A01**

FRR-182
Calculations of Transonic Potential Flow over Cascades.
N82-11041/2 1270 PC **A03**/MF **A01**

FSGTR/INT-116
Remote Automatic Weather Station for Resource and Fire Management Agencies.
PB82-107335 1087 PC **A02**/MF **A01**

FSGTR-PSW-54
Oak Management in California.
PB82-134453 1082 PC **A02**/MF **A01**

FSGTR-PSW-55
POLO2: A User's Guide to Multiple Probit or LOgit Analysis.
PB82-134487 1198 PC **A03**/MF **A01**

FSGTR-RM-83
The Activity Fuel Appraisal Process: Instructions and Examples.
PB82-107319 1081 PC **A04**/MF **A01**

FSGTR-RM-84
Design Criteria for Avalanche Control Structures in the Runout Zone.
PB82-108093 1169 PC **A03**/MF **A01**

FSRN-INT-319
Trends in Recreational Use of National Forest Wilderness.
PB82-134297 1114 PC **A02**/MF **A01**

FSRN-PSW-350
Preserving the Green Sale Value of Dying Ponderosa Pine with Lindane.
PB82-134446 1082 PC **A02**/MF **A01**

FSRN-PSW-352
Field Evaluation of Phloem-Mobile Acephate for Suppression of Southern Pine Beetle.
PB82-134479 1082 PC **A02**/MF **A01**

FSRN-PSW-354
New Record of Introduced Hosts for the Mountain Pine Beetle in California.
PB82-134438 1082 PC **A02**/MF **A01**

FSRP/INT-281
Monoterpenes of Lodgepole Pine Phloem as Related to Mountain Pine Beetles.
PB82-107293 1081 PC **A02**/MF **A01**

FSWEC-77/0004
DSMS Update System.
PB82-121898 1095 CP **T05**

FSWEC-77/0004-1
DSMS Update System, User's Guide.
PB82-121906 1095 PC **A02**/MF **A01**

FSWEC-77/0109
File Analysis and Selection Technique (FAST).
PB82-121815 1095 CP **T05**

FSWEC-77/0109-1
File Analysis and Selection Technique (FAST). Users Manual.
PB82-121823 1095 PC **A09**/MF **A01**

FSWEC-77/0368
INFO: The JHU/APL Information Package.
PB82-121740 1174 CP **T14**

FSWEC-77/0368-1
INFO: The JHU/APL Information Package Manual.
PB82-121757 1174 PC **A23**/MF **A01**

FSWEC-79/0003
Patch Macro and Load Module (IRSPATCH).
PB82-121765 1174 CP **T03**

FSWEC-79/0105
Plotting Routines NOMEN and CLINE.
PB82-121872 1175 Mag Tape $95.00

FSWEC-80/0047
CLMTIC3 - Tally Incidence of Characters.
PB82-121856 1175 CP **T03**

FSWEC-80/0048
COPY3 - Copy Sequential Data Sets.
PB82-121864 1175 CP **T02**

FSWEC-80/0109
Label Utility System.
PB82-121831 1095 CP **T03**

FSWEC-80/0109-1
Label Utility System.
PB82-121849 1095 PC **A05**/MF **A01**

FSWEC-80/0114
EEO System.
PB82-121914 1109 CP **T05**

FSWEC-80/0114-1
EEO Statistics. Computer Operation Manual.
PB82-121922 1109 PC **A04**/MF **A01**

FSWEC-80/0118
COBOL Structured Code Analyzer.
PB82-121880 1175 CP **T05**

FSWEC-80/0146
Methods and Standards System.
PB82-121799 1091 CP **T11**

FSWEC-80/0146-1
Methods and Standards System. Computer Operation Manual.
PB82-121807 1091 PC **A04**/MF **A01**

FSWEC-81/0040
COBOL Audit and Debugging Aid (CADA INSERT).
PB82-121930 1175 CP **T05**

FSWEC-81/0040-1
COBOL Audit and Debugging Aid (CADA INSERT). Technical Note.
PB82-121948 1175 PC **A04**/MF **A01**

FSWEC-81/0041
COBOL Analysis and Translate System (CATS).
PB82-121773 1174 CP **T14**

FSWEC-81-0041-1
COBOL Analysis and Translate System (CATS). Technical Note.
PB82-121781 1175 PC **A12**/MF **A01**

FTC/OPP-81/06
Future Developments in the Food Industry and Their Implications for the Federal Trade Commission.
PB82-132366 1098 PC **A08**/MF **A01**

FTC/OPP-81/07
Future Developments in the Food Industry: Probable Efforts at Vertical Integration by Food Retailers.
PB82-132374 1098 PC **A05**/MF **A01**

FTC/OPP-81/08
Future Developments in the Food Industry: Probable Emergence of Near Field Fermentation Conversion Centers.
PB82-132382 1099 PC **A03**/MF **A01**

FTD-ID(RS)T-0709-81
Selected Articles--Translation.
AD-A107 322/0 1077 PC **A03**/MF **A01**

FTD-ID(RS)T-0721-81
China's Ballistic Missile Plans--Translation.
AD-A107 426/9 1232 PC **A02**/MF **A01**

FWS/FWPO-81/01
Convention on International Trade in Endangered Species of Wild Fauna and Flora; 1979 Annual Report for the United States of America.
PB82-128646 1098 PC **A10**/MF **A01**

FWS/OBS-80/24
Coal Surface Mining Reclamation and Fish and Wildlife Relationships in the Easten United States. Volume I: Past Findings, the Surface Mining Law of 1977 (P.L. 95-87), Planning and Management Considerations, and Information Sources.
PB82-130816 1211 PC **A05**/MF **A01**

FWS/OBS-80/25
Coal Surface Mining Reclamation and Fish and Wildlife Relationships in the Eastern United States. Volume II: Opportunities and Approaches for Fish and Wildlife Planning and Management in Coal Surface Mining, Reclamation and Postmining Land Uses.
PB82-130824 1211 PC **A09**/MF **A01**

FWS/OBS-81/04-VOL-1
Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume I,
PB82-131426 1211 PC **A23**/MF **A01**

FWS/OBS-81/04-VOL-2
Proceedings of the National Symposium on Freshwater Inflow to Estuaries: Volume II,
PB82-131434 1211 PC **A23**/MF **A01**

FWS/OBS-81/05
Coal Combustion Waste Manual: Evaluating Impacts to Fish and Wildlife.
PB82-141359 1216 PC **A08**/MF **A01**

FWS/OBS-81/13
Distribution and Abundance of Marine Birds and Mammals Wintering in the Kodiak Area of Alaska.
PB82-140187 1155 PC **A05**/MF **A01**

FWS/OBS-81/43
User's Guide to the Physical Habitat Simulation System (PHABSIM).
PB82-134222 1160 PC **A11**/MF **A01**

FWS/OBS-81/45
An Assessment of Wetland Habitat Establishment at a Central Florida Phosphate Mine Site.
PB82-130808 1211 PC **A06**/MF **A01**

G-124
Comparison of the Caries-Preventive Effects of Neutral Sodium Fluoride and Acidulated Phosphate Fluoride.
PB82-135203 1132 PC **A04**/MF **A01**

GA-A-15837
HTGR-GT Closed-Cycle Gas Turbine: A Plant Concept with Inherent Cogeneration (Power Plus Heat Production) Capability.
GA-A-15837 1242 PC **A02**/MF **A01**

GA-A-16389
Effect of Microstructure on the Mechanical Properties of a Commercial 12Cr-1Mo Steel (HT-9).
DE82000082 1248 PC **A02**/MF **A01**

GAO/AFMD-81-66
Review of Department of Transportation's Response to Recommendations in the Senate Report on the Federal Aviation Administration's En Route Air Traffic Control Computer System.
AD-A106 850/1 1236 PC **A02**/MF **A01**

GAO/AFMD-81-71
Data on Small Business--Much is Collected but it Should be Integrated for Better Use.
AD-A106 851/9 1094 PC **A02**/MF **A01**

GAO/AFMD-81-77
Allegations that a Political Appointee at the Environmental Protection Agency was Exercising Control over the Office of the Inspector General.
AD-A107 190/1 1108 PC **A02**/MF **A01**

GAO/AFMD-81-86
Review of Circumstances of the Mass Removal of Statutory Inspectors General.
AD-A107 189/3 1108 PC **A02**/MF **A01**

GAO/AFMD-81-93
Terminating the Audit of the National Flood Insurance Program's Fiscal 1980 Financial Statements.
AD-A107 188/5 1089 PC **A02**/MF **A01**

GAO/AFMD-81-94
Examination of the Effectiveness of Statutory Offices of Inspector General.
AD-A107 187/7 1089 PC **A02**/MF **A01**

GAO/CED-81-79
Transportation Contingency Plans for Future Gas Shortages will not Meet Commuter Needs.
AD-A106 826/1 1179 PC **A04**/MF **A01**

GAO/CED-81-88
Health and Safety Deficiencies Found at Water Recreation Areas.
AD-A106 827/9 1122 PC **A03**/MF **A01**

GAO/CED-81-108
HUD Should Strengthen Mortgagee Monitoring to Reduce Losses.
AD-A107 283/4 1097 PC **A02**/MF **A01**

GAO/CED-81-109
Corps of Engineers' Acquisition of Fish Hatchery Proves Costly.
AD-A106 828/7 1079 PC **A06**/MF **A01**

GAO/CED-81-119
Cooperative Extension Service's Mission and Federal Role Need Congressional Clarification.
AD-A107 462/2 1102 PC **A04**/MF **A01**

GAO/CED-81-121
Efforts to Improve School Lunch Programs--Are They Paying Off.
AD-A106 829/5 1137 PC **A05**/MF **A01**

GAO/CED-81-122
Still No Progress in Implementing Controls over Contracts and Grants with Indians.
AD-A106 830/3 1087 PC **A05**/MF **A01**

GAO/CED-81-127
Controller Staffing and Training at Four FAA Air Traffic Control Facilities.
AD-A106 831/1 1105 PC **A03**/MF **A01**

GAO/CED-81-128
Information on the U.S. Coast Guard's Decision to Purchase the M/V Cowslip Vessel.
AD-A107 374/1 1231 PC **A02**/MF **A01**

GAO/CED-81-130
Analysis of HUD's May 4, 1981 Response Concerning Its Efforts to Alleviate Housing Abandonment.
AD-A106 832/9 1203 PC **A02**/MF **A01**

GAO/CED-81-133
Consumers Need More Reliable Automobile Fuel Economy Data.
AD-A106 833/7 1179 PC **A03**/MF **A01**

GAO/CED-81-135
Federal Land Acquisition and Management Practices.
AD-A106 834/5 1203 PC **A05**/MF **A01**

GAO/CED-81-136
Legislative and Regulatory Actions Needed to Deal with a Changing Domestic Telecommunications Industry.
AD-A106 835/2 1102 PC **A11**/MF **A01**

GAO/CED-81-139
Review of the Navajo and Hopi Indian Relocation Commission's Program.
AD-A106 836/0 1113 PC **A02**/MF **A01**

GAO/CED-81-140
Conrail Needs to Further Improve Inventory Control and Management.
AD-A106 837/8 1088 PC **A04**/MF **A01**

GAO/CED-81-145
Comments on Interior's Surface Mining Regulations.
AD-A107 185/1 1161 PC **A02**/MF **A01**

GAO/CED-81-146
Eliminating Contractor Inspections of Federal Water Projects Could Save Millions.
AD-A106 838/6 1203 PC **A03**/MF **A01**

GAO/CED-81-147
Inquiry into the Status of a Proposal to Construct 16 Single-Family Detached Homes for the Cuyahoga Metropolitan Housing Authority in Cleveland, Ohio.
AD-A106 891/5 1113 PC **A02**/MF **A01**

GAO/CED-81-149
SBA's 7(j) Management Assistance Program: Changes Needed to Improve Efficiency and Effectiveness.
AD-A106 839/4 1088 PC **A04**/MF **A01**

GAO/CED-81-150
GAO Comments on the Impact of the USDA Reorganization of Nutrition.
AD-A106 940/0 1089 PC **A02**/MF **A01**

GAO/CED-81-151
SBA's Progress in Implementing the Public Law 95-507 Subcontracting and Surety Bond Waiver Provisions has been Limited.
AD-A106 840/2 1088 PC **A03**/MF **A01**

GAO/CED-81-152
Grain Fumigation: A Multifaceted Issue Needing Coordinated Attention.
AD-A106 841/0 1079 PC **A02**/MF **A01**

GAO/CED-81-156
Information on Peanut Allotment Owners that Lease and Rent Away Rather Than Plant Their Peanut Allotments/Quotas.
AD-A107 377/4 1079 PC **A02**/MF **A01**

GAO/CED-81-157
Storage Cost Data on CCC-Owned Dairy Commodities.
AD-A106 892/3 1137 PC **A02**/MF **A01**

GAO/EMD-81-24
Status of Strategic Petroleum Reserve Activities--October 1980.
AD-A107 196/8 1266 PC **A02**/MF **A01**

GAO/EMD-81-88
FERC Should Improve the Natural Gas Well Determination Process.
AD-A106 859/2 1265 PC **A03**/MF **A01**

GAO/EMD-81-92
Questions Concerning DOE's Assignment of Operating and Testing Responsibilities for OTEC-1.
AD-A106 860/0 1179 PC **A02**/MF **A01**

GAO/EMD-81-93
Energy-Efficient and Cost-Effective Equipment Should be Installed in New Government Housing.
AD-A106 900/4 1199 PC **A03**/MF **A01**

GAO/EMD-81-96
Follow-up Report on Domestic Aluminum Resources: Dilemmas of Development.
AD-A106 901/2 1191 PC **A02**/MF **A01**

GAO/EMD-81-103
Energy Impacted Area Development Assistance Program's Designation Criteria.
AD-A106 902/0 1180 PC **A02**/MF **A01**

GAO/EMD-81-104
Minerals Critical to Developing Future Energy Technologies, Their Availability, and Projected Demand.
AD-A106 903/8 1180 PC **A03**/MF **A01**

GAO/EMD-81-105
Burdensome and Unnecessary Reporting Requirements of the Public Utility Regulatory Policies Act Need to be Changed.
AD-A106 904/6 1180 PC **A03**/MF **A01**

GAO/EMD-81-106
Greater Commitment Needed to Solve Continuing Problems at Three Mile Island.
AD-A106 915/2 1242 PC **A06**/MF **A01**

GAO/EMD-81-107
Status of Strategic Petroleum Reserve Activities.
AD-A107 373/3 1266 PC **A02**/MF **A01**

GAO/EMD-81-110
Elimination of Federal Funds for the Heber Project will Impede Full Development and Use of Hydrothermal Resources.
AD-A106 916/0 1180 PC **A02**/MF **A01**

GAO/EMD-81-111
Congress Should Increase Financial Protection to the Public from Accidents at DOE Nuclear Operations.
AD-A106 917/8 1242 PC **A03**/MF **A01**

NTIS ORDER/REPORT NUMBER INDEX

GAO/EMD-81-112
Update of Cost Information Contained in a Previous GAO Report on Specific Aspects of the Clinch River Breeder Reactor Project.
AD-A106 918/6 1246 PC **A02**/MF **A01**

GAO/EMD-81-113
Ineffective Management of the Appropriate Technology Small Grants Program.
AD-A106 882/4 1088 PC **A02**/MF **A01**

GAO/EMD-81-115
Options for Establishing an Energy Conservation Consolidated Grant Program.
AD-A106 919/4 1180 PC **A02**/MF **A01**

GAO/EMD-81-116
Synthetic Fuels Corporation's Management of Demonstration Projects Would Be Limited.
AD-A106 920/2 1266 PC **A03**/MF **A01**

GAO/EMD-81-117-VOL-1
The United States Remains Unprepared for Oil Import Disruptions. Volume I. Summary: Includes Conclusions and Recommendations.
AD-A106 921/0 1180 PC **A05**/MF **A01**

GAO/EMD-81-117-VOL-2
The United States Remains Unprepared for Oil Import Disruptions. Volume II. Detailed Review of Current Emergency Programs and Alternative Approaches.
AD-A106 922/8 1180 PC **A11**/MF **A01**

GAO/EMD-81-118
Status of Strategic Petroleum Reserve Activities--July 1981.
AD-A106 923/6 1266 PC **A02**/MF **A01**

GAO/EMD-81-123
Federal Energy Regulatory Commission Needs to Act on the Construction-Work-in-Progress Issue.
AD-A106 924/4 1180 PC **A02**/MF **A01**

GAO/EMD-81-126
Unresolved Issues Resulting from Changes in DOE's Synthetic Fuels Commercialization Programs.
AD-A106 883/2 1266 PC **A02**/MF **A01**

GAO/EMD-81-129
The United States Synthetic Fuels Corporation's Project Selection Guidelines Need Clarification.
AD-A107 184/4 1266 PC **A02**/MF **A01**

GAO/EMD-81-131
The Debate over Acid Precipitation--Opposing Views--Status of Research.
AD-A106 925/1 1083 PC **A04**/MF **A01**

GAO/EMD-81-132
Coal and Nuclear Wastes--Both Potential Contributors to Environmental and Health Problems.
AD-A106 884/0 1135 PC **A03**/MF **A01**

GAO/EMD-81-134
Potential Impediment of Foundry Capacity Relative to National Defense Needs.
AD-A106 885/7 1097 PC **A02**/MF **A01**

GAO/EMD-81-135
Improvements in Department of the Interior Leasing of Potential Aluminum Resources Are Necessary for More Timely Decisionmaking.
AD-A106 886/5 1191 PC **A02**/MF **A01**

GAO/EMD-81-142
The Oil Shale Corporation Loan Guarantee Contract.
AD-A106 887/3 1180 PC **A02**/MF **A01**

GAO/EMD-81-145
Analysis of Federal Funding for Electric Utility R&D Projects.
AD-A106 888/1 1088 PC **A02**/MF **A01**

GAO/FPCD-81-34
Recruiting Malpractice: Extent, Causes, and Potentials for Improvement.
AD-A106 844/4 1105 PC **A04**/MF **A01**

GAO/FPCD-81-56
Initial Skill Training for Navy Enlisted Personnel.
AD-A107 177/8 1107 PC **A02**/MF **A01**

GAO/FPCD-81-60
Alternatives to the Current Method of Computing General Schedule Pay.
AD-A107 178/6 1107 PC **A02**/MF **A01**

GAO/FPCD-81-62
Follow-Up on Actions to Improve Coordination and Utilization of Human Resources Research and Development.
AD-A107 179/4 1107 PC **A02**/MF **A01**

GAO/FPCD-81-69
Obstacles Hamper the Office of Personnel Management's Evaluation of the Implementation of the 1978 Civil Service Reform Act.
AD-A107 180/2 1107 PC **A02**/MF **A01**

GAO/FPCD-81-71
Tightening Eligibility Standards Could Cut Involuntary Retirement Costs by Millions of Dollars.
AD-A106 842/8 1105 PC **A02**/MF **A01**

GAO/FPCD-81-73
Serious Problems Need to be Corrected before Federal Merit Pay Goes into Effect.
AD-A106 843/6 1105 PC **A03**/MF **A01**

GAO/FPCD-81-74
Problems with the Small Business Administration's Merit Appraisal and Compensation System.
AD-A107 181/0 1107 PC **A02**/MF **A01**

GAO/GGD-81-93
The Comptroller of the Currency Should Decide the Extent to Which His Action Control System is Needed.
AD-A107 182/8 1097 PC **A02**/MF **A01**

GAO/GGD-81-102
Fewer Agent Transfers Should Benefit the FBI and Its Agents as Well as Save Money.
AD-A107 183/6 1107 PC **A02**/MF **A01**

GAO/HRD-81-91
Social Security Administration Policies for Managing Its Administrative Law Judges.
AD-A107 191/9 1108 PC **A02**/MF **A01**

GAO/HRD-81-106
Veterans Administration's Efforts to Improve the Management of Paper Records in the Department of Veterans Benefits. A Major System Acquisition Project.
AD-A107 192/7 1095 PC **A02**/MF **A01**

GAO/HRD-81-107
Issues Related to the Longshoremen's and Harbor Workers' Compensation Act.
AD-A107 193/5 1108 PC **A02**/MF **A01**

GAO/HRD-81-112
Delays in Receiving and Investing Taxes are Reducing Railroad Retirement Program Interest Income.
AD-A106 861/8 1105 PC **A02**/MF **A01**

GAO/HRD-81-119
Concerns about HHS' Ability to Effectively Implement Incentive Funding for State Information Systems in the Aid to Families with Dependent Children Program.
AD-A106 871/7 1088 PC **A02**/MF **A01**

GAO/HRD-81-122
Ohio's 1981 Home Energy Assistance Program.
AD-A106 872/5 1180 PC **A02**/MF **A01**

GAO/HRD-81-123
Injury Compensation Process Delays Prompt Payment of Benefits to Federal Workers.
AD-A106 873/3 1088 PC **A04**/MF **A01**

GAO/HRD-81-127
Limits on Receipt of Multiple Disability Benefits Could Save Millions.
AD-A106 874/1 1106 PC **A02**/MF **A01**

GAO/HRD-81-128
Veterans Administration Education Loan Program Should be Terminated: Legislative Action Taken.
AD-A106 845/1 1105 PC **A02**/MF **A01**

GAO/HRD-81-131
The National Institute on Alcohol Abuse and Alcoholism Should Make Greater Efforts to Support Treatment Demonstration Projects.
AD-A107 194/3 1123 PC **A02**/MF **A01**

GAO/HRD-81-133
States' Efforts to Detect Duplicate Public Assistance Payments.
AD-A106 846/9 1113 PC **A02**/MF **A01**

GAO/HRD-81-136
Department of Labor Needs to Give CETA Prime Sponsors More Guidance and Assistance for Implementing Monitoring Requirements.
AD-A106 847/7 1105 PC **A02**/MF **A01**

GAO/HRD-81-139
The Guaranteed Student Loan Information System Needs a Thorough Redesign to Account for the Expenditure of Billions.
AD-A106 875/8 1088 PC **A03**/MF **A01**

GAO/HRD-81-140
Medicare's Reimbursement Policies for Durable Medical Equipment Should be Modified and Made More Consistent.
AD-A106 876/6 1122 PC **A03**/MF **A01**

GAO/HRD-81-146
Information on Funding Commitments from Comprehensive Employment and Training Act Titles III and IV during Fiscal Year 1981.
AD-A106 877/4 1106 PC **A04**/MF **A01**

GAO/HRD-81-148
The Veterans Administration's Efforts to Consolidate Computer Programming Resources at a Single Location.
AD-A107 197/6 1108 PC **A02**/MF **A01**

GAO/HRD-81-150
Improvements Needed in Assessing Penalties and Controlling Penalty Collections Resulting from Occupational Safety and Health Inspections.
AD-A106 848/5 1136 PC **A02**/MF **A01**

GAO/HRD-81-152
Allocation of an Air Force Contractor's Pension Fund Assets May be Inequitable.
AD-A107 375/8 1090 PC **A02**/MF **A01**

GAO/HRD-81-153
Follow-Up Review to Determine the Extent to Which the Department of Health and Human Services has Implemented the Recommendations in Our Report: 'Increased Federal Efforts Needed to Better Identify, Treat, and Prevent Child Abuse and Neglect'.
AD-A106 849/3 1113 PC **A02**/MF **A01**

GAO/ID-81-35
U.S. Laws and Regulations Applicable to Imports from Nonmarket Economies Could be Improved.
AD-A106 878/2 1097 PC **A05**/MF **A01**

GAO/ID-81-38
Unresolved Issues Remain Concerning U.S. Participation in the International Energy Agency.
AD-A106 879/0 1102 PC **A07**/MF **A01**

GAO/ID-81-39
Management of the Department of State Office of Passport Services Needs to be Improved.
AD-A106 880/8 1088 PC **A04**/MF **A01**

GAO/ID-81-62
U.S. Role in Sinai Important to Mideast Peace.
AD-A106 899/8 1102 PC **A02**/MF **A01**

GAO/ID-81-63
Industry Views on the Ability of the U.S. Photovoltaics Industry to Compete in Foreign Markets.
AD-A106 881/6 1097 PC **A09**/MF **A01**

GAO/MASAD-81-27
Military Contractor-Operated Stores' Contracts are Unmanageable and Vulnerable to Abuse.
AD-A107 499/6 1231 PC **A04**/MF **A01**

GAO/MASAD-81-37
FAA's Communications Equipment Replacement Plans.
AD-A107 186/9 1233 PC **A02**/MF **A01**

GAO/MASAD-81-41
Questionable Use of the C-X and Other Air Force Weapon System Funds.
AD-A106 898/0 1231 PC **A02**/MF **A01**

GAO/MASAD-81-43
The British Sting Ray Torpedo: Information Should be Obtained to Determine Potential Benefits to U.S. Antisubmarine Warfare Programs.
AD-A106 896/4 1252 PC **A02**/MF **A01**

GAO/MASAD-81-44
Evaluation of the Army's Advanced Field Artillery Tactical Data System.
AD-A106 897/2 1251 PC **A02**/MF **A01**

GAO/MASAD-82-5
Budgetary Pressures Created by the Army's Plans to Procure New Major Weapon Systems are Just Beginning.
AD-A107 284/2 1089 PC **A03**/MF **A01**

GAO/PAD-81-1
Billions of Dollars are Involved in Taxation of the Life Insurance Industry -- Some Corrections in the Law are Needed.
AD-A106 856/8 1097 PC **A11**/MF **A01**

GAO/PAD-81-68
Special Estate Tax Provisions for Farmers Should be Simplified to Achieve Fair Distribution of Benefits.
AD-A106 857/6 1102 PC **A05**/MF **A01**

GAO/PAD-81-87
Status Report on Implementation of GAO's Audit Findings and Recommendations.
AD-A107 376/6 1090 PC **A03**/MF **A01**

GAO/PAD-81-88
Progress in Improving Program and Budget Information for Congressional Use.
AD-A106 858/4 1088 PC **A03**/MF **A01**

GAO/PLRD-81-34
Logistics Concerns over Navy's Guided Missile Frigate FFG-Class.
AD-A107 500/1 1224 PC **A04**/MF **A01**

GAO/PLRD-81-54
The Navy Must Improve Its Accountability for Conventional Ammunition.
AD-A107 174/5 1230 PC **A02**/MF **A01**

GAO/PLRD-81-61
Review of Government-Wide Contracting Systems for Film and Videotape Productions.
AD-A107 175/2 1089 PC **A02**/MF **A01**

GAO/PLRD-81-63
Allegations of Unfair Bidding Requirements at Griffiss Air Force Base, Rome, New York.
AD-A106 893/1 1088 PC **A02**/MF **A01**

GAO/PLRD-81-64
Allegations of Unethical Bidding Practices on Federal Construction Contracts.
AD-A107 176/0 1089 PC **A02**/MF **A01**

GAO/PLRD-81-66
Inquiry Concerning Denial of Contracts to Low Offeror for Army Translation Services.
AD-A106 894/9 1088 PC **A02**/MF **A01**

GAO/PLRD-81-68
HUD's Oversight of Procurement by Public Housing Authorities Needs Strengthening.
AD-A106 895/6 1089 PC **A02**/MF **A01**

GER-17020
SAR Processing on the MPP.
N82-11801/9 1174 PC **A05**/MF **A01**

GF-3706-1067
Traffic Diversion Software Applications Summary.
PB82-131673 1212 PC **A04**/MF **A01**

GGD-82-2
Stronger Federal Effort Needed in Fight Against Organized Crime.
PB82-139148 1115 PC **A05**/MF **A01**

GJBX-23(79)(V.2-A)
Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Arizona--New Mexico, Mesa Quadrangle.

GJBX-23(79)(V.2-A) 1163 PC **A15**/MF **A01**

GJBX-23(79)(V.2-B)

Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Arizona--New Mexico, Clifton Quadrangle.
GJBX-23(79)(V.2-B) 1163 PC **A15**/MF **A01**

GJBX-23(79)(V.2-C)

Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Arizona--New Mexico, Tucson Quadrangle.
GJBX-23(79)(V.2-C) 1163 PC **A19**/MF **A01**

GJBX-35(80)(V.2)

Nure Aerial gamma-Ray and Magnetic Reconnaissance Survey: Colorado-Arizona Area, Grand Canyon NJ 12-10 Quadrangle.
GJBX-35(80)(V.2) 1163 PC **A09**/MF **A01**

GJBX-37(79)(V.1)

Aerial Radiometric and Magnetic Survey: Seguin National Topographic Map, Texas Gulf Coast.
GJBX-37(79)(V.1) 1163 PC **E13**/MF **A01**

GJBX-37(79)(V.2)

Aerial Radiometric and Magnetic Survey: Seguin National Topographic Map, Texas Gulf Coast.
GJBX-37(79)(V.2) 1163 PC **A08**/MF **A01**

GJBX-40(79)(V.2-A)

Study of Airborne gamma-Ray Spectrometer Data Procedures: Wind River Basin, Wyoming, Casper Quadrangle.
GJBX-40(79)(V.2-A) 1163 PC **A14**/MF **A01**

GJBX-40(79)(V.2-B)

Study of Airborne gamma-Ray Spectrometer Data Procedures: Wind River Basin, Wyoming, Arminto Quadrangle.
GJBX-40(79)(V.2-B) 1163 PC **A05**/MF **A01**

GJBX-40(79)(V.2-D)

Study of Airborne gamma-Ray Spectrometer Data Procedures: Wind River Basin, Wyoming, Thermopolis Quadrangle.
GJBX-40(79)(V.2-D) 1163 PC **A06**/MF **A01**

GJBX-59(80)(V.2)

Aerial Radiometric and Magnetic Reconnaissance Survey of South-Central Colorado Trinidad Quadrangle.
GJBX-59(80)(V.2) 1164 PC **E13**/MF**$6.00**

GJBX-71(80)(V.2)(OGDEN)

Aerial gamma Ray and Magnetic Survey: Idaho Project, Ogden Quadrangle, Utah and Wyoming. Final Report.
GJBX-71(80)(V.2)(OGDEN) 1164 PC **A18**/MF **A01**

GJBX-71(80)(V.2)(SL)

Aerial gamma Ray and Magnetic Survey: Idaho Project, Salt Lake City Quadrangle of Utah. Final Report.
GJBX-71(80)(V.2)(SL) 1164 PC **A19**/MF **A01**

GJBX-72(80)(V.1)

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Norton Bay Quadrangle (Alaska). Final Report.
GJBX-72(80)(V.1) 1164 PC **E04**/MF **A01**

GJBX-73(80)(V.1)

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Nulato Quadrangle (Alaska). Final Report.
GJBX-73(80)(V.1) 1164 PC **E03**/MF **A01**

GJBX-76(80)(V.1)

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Medfra Quadrangle (Alaska). Final Report.
GJBX-76(80)(V.1) 1164 PC **E04**/MF **A01**

GJBX-77(80)(V.1)

Airborne gamma-Ray Spectrometer and Magnetometer Survey: McGrath Quadrangle (Alaska). Final Report.
GJBX-77(80)(V.1) 1164 PC **E04**/MF **A01**

GJBX-78(80)(V.1)

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Ophir Quadrangle (Alaska). Final Report.
GJBX-78(80)(V.1) 1164 PC **E04**/MF **A01**

GJBX-79(80)(V.1)

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Sleetmute Quadrangle (Alaska). Final Report.
GJBX-79(80)(V.1) 1164 PC **E04**/MF **A01**

GJBX-79(80)(V.2)

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Sleetmute Quadrangle (Alaska). Final Report.
GJBX-79(80)(V.2) 1164 PC **A06**/MF **A01**

GJBX-88(79)(V.2)MARFA

NURE Aerial gamma-Ray and Magnetic Reconnaissance Survey: Big Bend Area, MARFA MH 13-5, Fort Stockton MH 13-6, Presidio MH 13-8, and Emory Peak MH 13-9 Quadrangles.
GJBX-88(79)(V.2)MARFA 1165 PC **A12**/MF **A01**

GJBX-92(80)(V.2A)

Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Ohio, Pennsylvania and West Virginia: Canton Quadrangle. Final Report.
GJBX-92(80)(V.2A) 1165 PC **E05**/MF **A01**

GJBX-92(80)(V.2D)

Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Ohio and West Virginia: Charleston Quadrangle. Final Report.
GJBX-92(80)(V.2D) 1165 PC **E05**/MF **A01**

GJBX-92(80)(V.2E)

Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Virginia and West Virginia: Charlottesville Quadrangle. Final Report.
GJBX-92(80)(V.2E) 1165 PC **E08**/MF**$4.00**

GJBX-92(80)(V.2F)

Aerial Radiometric and Magnetic Reconnaissance Survey of Portions of Kentucky, Virginia, and West Virginia: Jenkins Quadrangle. Final Report.
GJBX-92(80)(V.2F) 1165 PC **E06**/MF**$4.00**

GJBX-99(79)(V.2)

Aerial Radiometric and Magnetic Survey: Corpus Christi/Laredo National Topographic Map, Texas Gulf Coast.
GJBX-99(79)(V.2) 1165 PC **A10**/MF **A01**

GJBX-108(78)(V.1)(TYEK)

NURE Aerial gamma-Ray and Magnetic Reconnaissance Survey. Cook Inlet Alaska Area: Tyonek Quadrangle.
GJBX-108(78)(V.1)(TYEK) 1162 PC **A05**/MF **A01**

GJBX-108(78)(V.2)(ANGE)

NURE Aerial gamma-Ray and Magnetic Reconnaissance Survey. Cook Inlet Alaska Area: Anchorage Quadrangle.
GJBX-108(78)(V.2)(ANGE) 1162 PC **A05**/MF **A01**

GJBX-136(80)

Near-Surface Moisture and Biomass Influences on the Reliability of Aerial Radiometric Surveys as a Measure of Natural Radioelement Concentrations.
GJBX-136(80) 1162 PC **A08**/MF **A01**

GJBX-149(80)

Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Springfield Quadrangle of Missouri. Final Report.
GJBX-149(80) 1162 PC **E06**/MF **A01**

GJBX-150(80)

Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Harrison Quadrangle, Missouri and Arkansas. Final Report.
GJBX-150(80) 1162 PC **E07**/MF **A01**

GJBX-151(80)

Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Shreveport Quadrangle of Louisiana. Final Report.
GJBX-151(80) 1162 PC **E07**/MF **A01**

GJBX-152(80)

Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Alexandria Quadrangle of Louisiana and Texas. Final Report.
GJBX-152(80) 1162 PC **E08**/MF **A01**

GJBX-153(80)

Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Jackson Quadrangle of Mississippi and Louisiana. Final Report.
GJBX-153(80) 1163 PC **E07**/MF **A01**

GJBX-154(80)

Aerial gamma Ray Amd Magnetic Survey: Mississippi and Florida Survey, Meridian Quadrangle of Mississippi and Alabama. Final Report.
GJBX-154(80) 1163 PC **E08**/MF **A01**

GJBX-155(80)

Aerial gamma Ray and Magnetic Survey: Mississippi and Florida Airborne Survey, Hattiesburg Quadrangle of Mississippi, Alabama, and Louisiana. Final Report.
GJBX-155(80) 1163 PC **E07**/MF **A01**

GJBX-299-81

Airborne gamma-Ray Spectrometer and Magnetometer Survey: Harrison Bay Quadrangle, Alaska. Final Report, Volume 1.
DE82000338 1161 PC **E06**/MF **A01**

GRI-78/0050

Application of Intermittent Ignition Devices to Commercial Cooking Equipment.
PB82-141078 1138 PC **A03**/MF **A01**

GRI-79-0110

Evaluation of Resource-Assessment Values and in-Situ Combustion Potential for the OH-4 and PA-3 Wells. Final Report.
DE82000388 1157 PC **A08**/MF **A01**

GRI-80/0074

High Temperature Metallic Recuperator.
PB82-141102 1202 PC **A07**/MF **A01**

GRI-80/0079.1

Commercial Cooking Equipment Improvement. Volume I: Range Ovens.
PB82-141060 1202 PC **A03**/MF **A01**

GRI-80/0080

Commercial Cooking Equipment Improvement.
PB82-141094 1138 PC **A04**/MF **A01**

GRI-80/0082

Development and Field Verification of a Model of House Air Infiltration for Single Family Residences.
PB82-141110 1226 PC **A05**/MF **A01**

GRI-80/0100

Kinetics of Gas Hydrate Formation. Part I: Kinetics of Ethane Gas Hydrate Formation. Part II: Kinetics of Natural Gas Hydrate Formation.
PB82-138868 1153 PC **A03**/MF **A01**

GSRMP-9

Case Study Data Base Companion Report 3 to Simulation of Geothermal Subsidence (LBL-10571).
LBL-10839 1166 PC **A05**/MF **A01**

HCFA/PUB-03067

Physicians and Financial Incentives.
PB82-133695 1132 PC **A07**/MF **A01**

HCFA/PUB-03098

National Monthly Medicaid Statistics, April 1979.
PB82-135815 1132 PC **A03**/MF **A01**

HCFA/PUB-03121

Issues in Physician Reimbursement: Conference Proceedings,
PB82-135757 1132 PC **A10**/MF **A01**

HCSD-81-002

Flexitime in an Army Medical Center.
AD-A107 470/7 1109 PC **A03**/MF **A01**

HCSD-81-003

Teleradiology.
AD-A107 431/9 1123 PC **A03**/MF **A01**

HCSD-81-004

An Assessment of the Dental Needs of Army Recruits.
AD-A107 290/9 1123 PC **A03**/MF **A01**

HCSD-81-014

Field Unit Readiness Study (FURS).
AD-A107 469/9 1109 PC **A02**/MF **A01**

HDL-CR-81-569-1

Establishment of Production Techniques for Transducer Acoustic Delay Lines on a Pilot Line Basis.
AD-A107 339/4 1178 PC **A07**/MF **A01**

HDL-TM-81-16

Scale Modeling for the PATRIOT Electromagnetic Pulse Test.
AD-A107 480/6 1232 PC **A05**/MF **A01**

HDL-TR-1966

Worst-Case Prediction of Single-Particle-Induced Permanent Failures in Microelectronics.
AD-A107 309/7 1171 PC **A02**/MF **A01**

HEC-TD-8-ADD

Guidelines for Calibration and Application of STORM Addendum. Description of SCS Method of Runoff Determination as Programmed in STORM.
AD-A107 077/0 1159 PC **A02**/MF **A01**

HEDL-TME-79-6

Thermophysical Properties of Selected Wear-Resistant Alloys.
HEDL-TME-79-6 1192 PC **A05**/MF **A01**

HEDL-TME-80-6

LWR Pressure Vessel Irradiation Surveillance Dosimetry.
NUREG/CR-1241-V4 1246 PC **A06**/MF **A01**

HEDL-TME-81-15

Dynamic Analysis to Establish Normal Shock and Vibration of Radioactive Material Shipping Packages.
NUREG/CR-2146-V1 1242 PC **A03**/MF **A01**

HIG-CONTRIB-758

Pacific Pleistocene Paleoclimatic Stratigraphies: A Comparative Analysis of Results.
AD-A107 025/9 1168 PC **A02**/MF **A01**

HIG-CONTRIB-1070

Crustal Structure of the Shatsky Rise from Seismic RefractiON Measurements.
AD-A107 027/5 1157 PC **A02**/MF **A01**

HIG-CONTRIB-1082

Geoacoustic Modeling of Deep-Sea Carbonate Sediments.
AD-A107 028/3 1168 PC **A02**/MF **A01**

HIG-CONTRIB-1096

Compressional-Shear Wave Coupling Induced by Velocity Gradients in Marine Sediments.
AD-A107 026/7 1252 PC **A02**/MF **A01**

HRP-0903306/9

Health Planning Reports: Abstracts. Volume 1, A-1 through A-7970.
HRP-0903306/9 1124 PC**$20.00**/MF **E01**

HRP-0903307/7

Health Planning Reports: Abstracts. Volume 2, A-7971 through A-16333.
HRP-0903307/7 1124 PC**$20.00**/MF **E01**

HRP-0903691/4

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Wisconsin, Volume 49, Part 1.
HRP-0903691/4 1124 PC **A12**/MF **A01**

HRP-0903692/2

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Wisconsin, Volume 49, Part 2.
HRP-0903692/2 1124 PC **A15**/MF **A01**

HRP-0903693/0

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Wyoming, Volume 50.
HRP-0903693/0 1124 PC **A14**/MF **A01**

HRP-0903694/8

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Virginia, Volume 46, Part 1.
HRP-0903694/8 1124 PC **A18**/MF **A01**

HRP-0903695/5

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Virginia, Volume 46, Part 2.
HRP-0903695/5 1125 PC **A19**/MF **A01**

HRP-0903696/3

Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: West Virginia, Volume 48, Part 1.
HRP-0903696/3 1125 PC **A16**/MF **A01**

NTIS ORDER/REPORT NUMBER INDEX

HRP-0903697/1
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: West Virginia, Volume 48, Part 2.
HRP-0903697/1 1125 PC **A15**/MF **A01**

HRP-0903698/9
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Washington, Volume 47.
HRP-0903698/9 1125 PC **A16**/MF **A01**

HRP-0903699/7
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Idaho, Volume 13.
HRP-0903699/7 1125 PC **A19**/MF **A01**

HRP-0903700/3
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Illinois, Volume 14, Part 1.
HRP-0903700/3 1125 PC **A16**/MF **A01**

HRP-0903701/1
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Illinois, Volume 14, Part 2.
HRP-0903701/1 1125 PC **A20**/MF **A01**

HRP-0903702/9
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Indiana, Volume 15, Part 1.
HRP-0903702/9 1125 PC **A14**/MF **A01**

HRP-0903703/7
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Indiana, Volume 15, Part 2.
HRP-0903703/7 1125 PC **A15**/MF **A01**

HRP-0903704/5
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kansas, Volume 16, Part 1.
HRP-0903704/5 1126 PC **A14**/MF **A01**

HRP-0903705/2
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kansas, Volume 16, Part 2.
HRP-0903705/2 1126 PC **A17**/MF **A01**

HRP-0903706/0
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kentucky, Volume 17, Part 1.
HRP-0903706/0 1126 PC **A12**/MF **A01**

HRP-0903707/8
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Kentucky, Volume 17, Part 2.
HRP-0903707/8 1126 PC **A17**/MF **A01**

HRP-0903708/6
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Louisiana, Volume 18, Part 1.
HRP-0903708/6 1126 PC **A10**/MF **A01**

HRP-0903709/4
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Louisiana, Volume 18, Part 2.
HRP-0903709/4 1126 PC **A11**/MF **A01**

HRP-0903710/2
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Massachusetts, Volume 21.
HRP-0903710/2 1126 PC **A10**/MF **A01**

HRP-0903711/0
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Maine, Volume 19.
HRP-0903711/0 1126 PC **A13**/MF **A01**

HRP-0903712/8
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Maryland, Volume 20.
HRP-0903712/8 1127 PC **A13**/MF **A01**

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Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Tennessee, Volume 42, Part 1.
HRP-0903713/6 1127 PC **A14**/MF **A01**

HRP-0903714/4
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Tennessee, Volume 42, Part 2.
HRP-0903714/4 1127 PC **A18**/MF **A01**

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HRP-0903715/1 1127 PC **A12**/MF **A01**

HRP-0903716/9
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HRP-0903716/9 1127 PC **A15**/MF **A01**

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HRP-0903717/7 1127 PC **A07**/MF **A01**

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HRP-0903718/5 1127 PC **A15**/MF **A01**

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HRP-0903720/1 1127 PC **A11**/MF **A01**

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HRP-0903722/7 1128 PC **A10**/MF **A01**

HRP-0903723/5
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Texas, Volume 43, Part 1.
HRP-0903723/5 1128 PC **A12**/MF **A01**

HRP-0903724/3
Employment, Mobility, and Personal Characteristics of Nurses Newly Licensed in 1979: Texas, Volume 43, Part 2.
HRP-0903724/3 1128 PC **A15**/MF **A01**

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HRP-0903770/6 1129 PC **A12**/MF **A01**

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HRP-0903771/4 1129 PC **A09**/MF **A01**

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Connection Between the Spin Magnetic Moment of an Electron and the Dirac Monopole.
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Nucleus-Nucleus Interaction in the Glauber Approximation.

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JINR-R-4-12399 1259 PC A02/MF A01

JINR-R-4-12509

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N82-11489/3 1262 PC A03/MF A01

L-14423

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L-14533

An Improved Transverse Shear Deformation Theory for Laminated Antisotropic Plates.
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L-14606

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L-14666

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L-14695

An Algorithm for Minimum-Cost Set-Point Ordering in a Cryogenic Wind Tunnel.
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L-14746

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LA-UR-80-551 1165 PC A02/MF A01

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Statistical Validity for Electron Probe Microanalysis of Organic Sulfur in Coal.
LA-UR-80-585 1228 PC A02/MF A01

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Design Analysis for the Control and Drive Retrofit of a Numerically Controlled Lathe.
LA-UR-80-621 1224 PC A02/MF A01

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Using Diffusion Measurements to Determine Pore-Size Distributions in Porous Materials.
LA-UR-80-635(REV.) 1151 PC A02/MF A01

LA-UR-80-716

TRAC Posttest Calculations of Semiscale Test S-06-3.
LA-UR-80-716 1247 PC A02/MF A01

LA-UR-80-738

Resistive G-Modes and Ballooning.
LA-UR-80-738 1261 PC A02/MF A01

LA-UR-80-741

In-Process Inventory Estimation for Pulsed Columns and Mixer-Settlers.
LA-UR-80-741 1248 PC A02/MF A01

LA-UR-80-1069

Fuel Damage Estimates for the TMI-2 Reactor.
LA-UR-80-1069 1248 PC A02/MF A01

LA-UR-80-1252

Thermodynamics of the Tantalum-Carbon-Chlorine-Hydrogen System Applied to the CVD of Carbide/Carbon Composite Materials.
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LA-UR-80-1358

Data Acquisition and Control for gamma Scanning.
LA-UR-80-1358 1241 PC A02/MF A01

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Computational Methods for LMFBR Whole-Core Accident Analysis.
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LA-UR-80-2086 1165 PC A02/MF A01

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Location of Hydraulic Fractures Using Microseismic Techniques.
LA-UR-80-2103 1165 PC A02/MF A01

LA-UR-80-2134

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LA-UR-80-2235

Role of Valons in Low-p/sub T/ Physics.
LA-UR-80-2235 1259 PC A02/MF A01

LA-UR-80-2342

Block Relaxation Strategies.
LA-UR-80-2342 1197 PC A02/MF A01

LA-UR-80-2400

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LA-UR-80-2400 1268 PC A02/MF A01

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LA-UR-80-2406 1239 PC A02/MF A01

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DE81025366 1087 PC A02/MF A01

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Exp 3 H(p,N) exp 3 He Differential Cross Sections Below 5 MeV and the n- exp 3 He Cross Sections.
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PB82-136615 1121 PC **A02**/MF **A01**

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Controlled Large-Scale Hatching of Brine Shrimp, 'Artemia salina',
PB82-136649 1121 PC **A02**/MF **A01**

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Culturing, Harvesting, and Grading 'Daphnia',
PB82-136300 1121 PC **A02**/MF **A01**

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Intensive Culture of Walleye ('Stizostedion vitreum vitreum'),
PB82-136391 1121 PC **A02**/MF **A01**

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The Use of Self-Feeders in Fish Culture,
PB82-136425 1121 PC **A02**/MF **A01**

LAMAR INFORMATION LEAFLET-81-02
Degassing Supersaturated Water for Fish Culture,
PB82-136623 1121 PC **A02**/MF **A01**

LASA/DP-8
Profiles of Basotho Farmers. Part I: Images of Basotho Farmers. Part II: Are the Basotho Subsistence Farmers. Part III: Progressive Farmers in Lesotho.
PB82-132762 1109 PC **A04**/MF **A01**

LASA/RR-5
Catalog of Holdings and Other References in the Lesotho MOA/LASA Library.
PB82-133133 1096 PC **A16**/MF **A01**

LASL-80-10(BRIEF)
US Energy Sources and Materials Needs.
LASL-80-10(BRIEF) 1182 PC **A02**/MF **A01**

LBL-6865
Saving Half of California's Energy and Peak Power in Buildings and Appliances Via Long-Range Standards and Other Legislation.
LBL-6865 1182 PC **A04**/MF **A01**

LBL-8233
Post Hartree-Fock: Configuration Interaction.
LBL-8233 1151 PC **A11**/MF **A01**

LBL-8382
Stability of Intense Transported BEAMS.
LBL-8382 1257 PC **A02**/MF **A01**

LBL-8706(REV.1)(PT.1)
DOE-2 Reference Manual.
LA-7689-M(Ver.2.1)(Pt.1) 1181 PC **A99**/MF **A01**

LBL-8772
Using DOE-2 at Lawrence Berkeley Laboratory.
LBL-8772 1087 PC **A04**/MF **A01**

LBL-8822
New Measurement Strategy for in Situ Testing of Wall Thermal Performance.
LBL-8822 1226 PC **A03**/MF **A01**

LBL-9062
Partitioning of Major, Minor, and Trace Elements During Simulated in-Situ Oil Shale Retorting.
LBL-9062 1151 PC **A20**/MF **A01**

LBL-9128
Beta-Gauge Methods Applied to Aerosol Samples.
LBL-9128 1241 PC **A03**/MF **A01**

LBL-9438
Ocean Thermal Energy Conversion Preliminary Data Report for the February 1978 GOTEC-03 Cruise to the Gulf of Mexico, Mobile Site.
LBL-9438 1186 PC **A03**/MF **A01**

LBL-9546
Intersecting Faults and Sandstone Stratigraphy at the Cerro Prieto Geothermal Field.
LBL-9546 1158 PC **A02**/MF **A01**

LBL-9576
Energy Efficient Buildings Program. Chapter from Energy and Environment Division Annual Report 1978.
LBL-9576 1201 PC **A04**/MF **A01**

LBL-9809
Combustion Research. Chapter from the Energy and Environment Division Annual Report 1978.
LBL-9809 1209 PC **A03**/MF **A01**

LBL-9816
Evaluation of Residential Building Energy-Performance Standards.
LBL-9816 1201 PC **A03**/MF **A01**

LBL-9959
Utility Solar Finance: Economic and Institutional Analysis.
LBL-9959 1098 PC **A05**/MF **A01**

LBL-10109
Spermatogonial Stem Cell Renewal Following Irradiation.
LBL-10109 1143 PC **A02**/MF **A01**

LBL-10166(REV.)
Chemistry of Silica in Cerro Prieto Brines.
LBL-10166(REV.) 1158 PC **A02**/MF **A01**

LBL-10189/1
BKY Programming Systems Bulletin No. 1. Guidelines for Converting FTN4 Programs to FTN5 and the New FORTRAN-77 Standard. First Edition.
LBL-10189/1 1174 PC **A03**/MF **A01**

LBL-10193(REV.)
Thermomechanical Modeling and Data Analysis for Heating Experiments at Stripa, Sweden.
LBL-10193(REV.) 1245 PC **A02**/MF **A01**

LBL-10259
Weldability of Thermally Grain-Refined Fe-12Ni-0.25Ti for Cryogenic Structural Applications.
LBL-10259 1192 PC **A03**/MF **A01**

LBL-10386
Seismic Isolation of an Electron Microscope.
LBL-10386 1228 PC **A02**/MF **A01**

LBL-10540
Subsurface Geological and Geophysical Study of the Cerro Prieto Geothermal Field.
LBL-10540 1158 PC **A02**/MF **A01**

LBL-10648
Efficient Access of Compressed Data.
LBL-10648 1095 PC **A02**/MF **A01**

LBL-10811
NRCC Software Catalog. Volume 1.
LBL-10811 1174 PC **A06**/MF **A01**

LBL-10839
Case Study Data Base Companion Report 3 to Simulation of Geothermal Subsidence (LBL-10571).
LBL-10839 1166 PC **A05**/MF **A01**

LBL-10861
SHAFT79 User's Manual.
LBL-10861 1166 PC **A04**/MF **A01**

LBL-10985
Analysis of Injection Testing of Geothermal Reservoirs.
LBL-10985 1166 PC **A02**/MF **A01**

LBL-11030
Nuclear Materials Research Progress Reports for 1979.
LBL-11030 1249 PC **A05**/MF **A01**

LBL-11072
Potential Uses of Spent Shale in the Treatment of Oil Shale Retort Waters.
LBL-11072 1209 PC **A02**/MF **A01**

LBL-11097
Operating Instructions for LBL Radon Measurement Facilities.
LBL-11097 1241 PC **A03**/MF **A01**

LBL-11109
Erosion-Corrosion-Wear Program.
LBL-11109 1192 PC **A02**/MF **A01**

LBL-11192
Annual Environmental Monitoring Report of the Lawrence Berkeley Laboratory, 1979.
LBL-11192 1246 PC **A02**/MF **A01**

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Labor Market Projections Model: A User's Guide to the Population, Labor Force, and Unemployment Projections Model at Lawrence Berkeley Laboratory.
LBL-11349 1097 PC **A04**/MF **A01**

LBL-11758
Thermodynamic Data for Flue-Gas Desulfurization Processes.
DE81030545 1150 PC **A04**/MF **A01**

LBL-13029
Relativistic Heavy-Ion Experiments.
DE81030544 1257 PC **A03**/MF **A01**

LBL-13227
Diffusion of Gases in Capillaries.
DE82000267 1253 PC **A06**/MF **A01**

LBL-13238
Coal Liquefaction Research, October 1, 1978-September 30, 1981.
DE81030379 1267 PC **A04**/MF **A01**

LBL-13258
Laser-Induced-Fluorescence Studies of Fragment Ions: CH Exp + and CD exp + .
DE82001010 1151 PC **A06**/MF **A01**

LCDS-81-18
Approximation of Processes and Applications to Control and Communication Theory,
AD-A107 520/9 1197 PC **A03**/MF **A01**

LEC-3
Evaluation of Low-Cost Extrusion Cooker in Sri Lanka.
PB82-133786 1137 PC **A07**/MF **A01**

LETC-0013-1
Water Availability for Development of Major Tar Sands Areas in Utah.
LETC-0013-1 1166 PC **A12**/MF **A01**

LIDS-P-1149
A Distributed Algorithm for Minimum Weight Directed Spanning Trees.
AD-A107 462/4 1173 PC **A02**/MF **A01**

LIDS-P-1153
Flow Control and Routing Techniques for Integrated Voice and Data Networks,
AD-A107 140/6 1233 PC **A03**/MF **A01**

LMI-ML103
Depot Support of Gas Turbine Engines.
AD-A107 141/4 1230 PC **A03**/MF **A01**

LMI-ML108
An Evaluation of Spares Acquistion Integrated with Production,
AD-A107 279/2 1231 PC **A06**/MF **A01**

LMI-RE902
Joining the Defense Directives and Defense Acquisition Regulatory Systems,
AD-A107 142/2 1230 PC **A02**/MF **A01**

LMSC-D-683375
Reactive Metal-Air Batteries for Automotive Propulsion. Final Report, August 1, 1978-November 30, 1979.
LMSC-D-683375 1188 PC **A08**/MF **A01**

LPC-79-03
Review on Photon-Photon Collisions in Electron Storage Rings.
LPC-79-03 1260 PC **A03**/MF **A01**

LPI-TR-81-04
Workshop on Early Crustal Genesis: Implications from Earth.
N82-11691/4 1158 PC **A03**/MF **A01**

LPNHEP-T-78-01
Meson F sub 1 Spin and Parity Measurement.
LPNHEP-T-78-01 1260 PC **A07**/MF **A01**

LR-29935-V-1
Experimental Study of Fuel Heating at Low Temperatures in a Wing Tank Model, Volume 1.
N82-11224/4 1268 PC **A04**/MF **A01**

M-360
Space Shuttle Main Engine Controller.
N82-11784/7 1273 PC **A03**/MF **A01**

MA-RD-920-78074
Improved Atomization of Residual Fuels for Marine Boilers. Volume II: Cold Flow Baseline Performance Testing and Variation of Key Parameters - Cold Flow Improvement of Marine Boiler Atomizers,
PB82-132614 1202 PC **A07**/MF **A01**

MA-RD-940-82004
Implications of Power Plant Coal Conversions on the Ports of New England: Volume I.
PB82-136409 1231 PC **A04**/MF **A01**
Implications of Power Plant Coal Conversions on the Ports of New England. Volume II: Appendices,
PB82-136417 1231 PC **A10**/MF **A01**

MAI-199
Multi-Family Solar Domestic Hot Water Analysis,
PB82-130139 1202 PC **A05**/MF **A01**

MASEC-PA-81-030
Passive-Solar Retrofit Concepts.
DE82000453 1200 PC **A03**/MF **A01**

MASEC-PA-81-033
Passive-Solar Multi-Family Concepts.
DE82000456 1200 PC **A05**/MF **A01**

MASEC-R-81-062
MASEC Industrial Fuel-Wood Program.
DE82000461 1268 PC **A03**/MF **A01**

MASEC/R-81-068
Interactive Model to Assess Economics of Anaerobic Digestion on the Farm.
DE82000452 1267 PC **A03**/MF **A01**

MCIC-81-42
Corrosion Fatigue of Metals in Marine Environments.
AD-A107 247/9 1191 PC **E19**/MF **E19**

MEL-81-19
Case Studies of the Impact of Federal Aid on Major Cities: City of Cleveland.
PB82-131558 1114 PC **A07**/MF **A01**

MERADCOM-2332
Fundamentals of Ion Motion in Electric Radiofrequency Multipole Fields.
AD-A107 243/8 1253 PC **A03**/MF **A01**

MERADCOM-2333
Determination of Sodium Gluconate in Corrosion-Removing Compounds.
AD-A107 244/6 1149 PC **A02**/MF **A01**

METC/CR-79/26
Procedures for Petrophysical, Mineralogical and Geochemical Characterization of Fine-Grained Clastic Rocks and Sediments.
METC/CR-79/26 1158 PC **A03**/MF **A01**

METC/SP-79/9
Proceedings of the Second Annual Methane Recovery from Coal Bed Symposium.
METC/SP-79/9 1166 PC **A11**/MF **A01**

MHSMP-80-20
Tool Force Evaluation of Lathe Machined High Explosives.
MHSMP-80-20 1250 PC **A03**/MF **A01**

MIT/LCS/TM-204
On the Expressive Power of Dynamic Logic. II,
AD-A107 430/1 1197 PC **A02**/MF **A01**

MIT-2295T9-15
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MIT-2295T9-15 1182 PC **A10**/MF **A01**

MLM-MU-80-62-0001
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MLM-MU-80-62-0001 1182 PC **A04**/MF **A01**

MLM-MU-81-67-0008
Evaluation of Resource-Assessment Values and in-Situ Combustion Potential for the OH-4 and PA-3 Wells. Final Report.
DE82000388 1157 PC **A08**/MF **A01**

MLM-2664
Aluminum Particle Surface Studies in Al/Cu sub 2 O by Electron Spectroscopy for Chemical Analysis and Auger Electron Spectroscopy.
MLM-2664 1250 PC **A02**/MF **A01**

MLM-2700
Annual Environmental Monitoring Report: Calendar Year 1979.
MLM-2700 1246 PC **A03**/MF **A01**

MLM-2727
Mound Facility Activities in Chemical and Physical Research: July-December 1979.
MLM-2727 1240 PC **A04**/MF **A01**

MLM-2731(OP)
Princetown I Data Analysis.
MLM-2731(OP) 1268 PC **A02**/MF **A01**

MS/S-81-034
Developments in Discrete Distributions 1969-1980.
AD-A106 931/9 1196 PC **A02**/MF **A01**

MS094-81
U.S. Technology Transfer to the Soviet Union: A Dilemma.
AD-A107 313/9 1090 PC **A07**/MF **A01**

MS108-81
Air War College Class of 1981 Retention Survey.
AD-A107 103/4 1107 PC **A10**/MF **A01**

MS114-81
Performance as a Factor in Enlisted Promotions.
AD-A107 298/2 1108 PC **A04**/MF **A01**

MS-5406
Digital Filters for Infrared Target Acquisition Sensors.
AD-A107 061/4 1236 PC **A02**/MF **A01**

MS-5433
Electromagnetic Long-Line Effects in Surface Wave Convolvers.
AD-A107 060/6 1252 PC **A02**/MF **A01**

MS-5434
The Effect of Acoustic Dispersion and Attenuation on SAW Convolver Performance.
AD-A107 057/2 1178 PC **A02**/MF **A01**

MS-5648
Simulation and Development of a PCSFSK Demodulator.
AD-A107 055/6 1233 PC **A02**/MF **A01**

MS-5649
Some Factors Affecting Angular Resolution in an Adaptive Antenna.
AD-A107 058/0 1178 PC **A02**/MF **A01**

MS-5667
Technology Assessment for Future EHF MILSATCOM Systems.
AD-A107 059/8 1233 PC **A02**/MF **A01**

MSC/TFR/1106/1103
Study of Graphite/Epoxy Composites for Material Flaw Criticality.
AD-A107 391/5 1190 PC **A07**/MF **A01**

MSDO-M-011-TN-02B
COBOL Analysis and Translate System (CATS). Technical Note.
PB82-121781 1175 PC **A12**/MF **A01**

MSDO-M-011-TN-08A
COBOL Audit and Debugging Aid (CADA INSERT). Technical Note.
PB82-121948 1175 PC **A04**/MF **A01**

MSHD-RD-80-070
Wave Forces on Causeway-Type Coastal Bridges: Effects of Angle of Wave Incidence and Cross-Section Shape.
PB82-131657 1211 PC **A12**/MF **A01**

MSNW-78-3035(V.2)
Analysis and Simulation of Performance Data for Residential Solar Heating and Heat Pump System in Seattle, Washington. Final Report, Volume II.
MSNW-78-3035(V.2) 1201 PC **A15**/MF **A01**

MTR-80W376
Non-Contacting Suspension and Propulsion Systems for Transportation Applications,
PB82-135591 1221 PC **A09**/MF **A01**

MTR-7482
An Approach to Selecting Panels of Experts,
PB82-139569 1110 PC **A04**/MF **A01**

MTR-7490
An Approach to Identifying Objectives for Targeted Research Programs,
PB82-139585 1111 PC **A04**/MF **A01**

MTR-7631
The Delphi Technique: Analysis of Responses to a Survey of Children's Mental Health Services Development,
PB82-139577 1110 PC **A03**/MF **A01**

N81-29494/4
Evaluation of Gravimetric Ground Truth Soil Moisture Data Collected for the Agricultural Soil Moisture Experiment, 1978 Colby, Kansas, Aircraft Mission.
N81-29494/4 1169 PC **A14**/MF **A01**

N81-29495/1
Development of Advanced Acreage Estimation Methods.
N81-29495/1 1156 PC **A07**/MF **A01**

N81-29496/9
Evaluation of Multiband, Multitemporal, and Transformed Landsat Mss Data for Land Cover Area Estimation.
N81-29496/9 1080 PC **A02**/MF **A01**

N81-29497/7
An Analysis of Haze Effects on Landsat Multispectral Scanner Data.
N81-29497/7 1080 PC **A03**/MF **A01**

N81-29498/5
The Multicategory Case of the Sequential Bayesian Pixel Selection and Estimation Procedure.
N81-29498/5 1198 PC **A02**/MF **A01**

N81-29499/3
Nationwide Forestry Applications Program. Analysis of Forest Classification Accuracy.
N81-29499/3 1081 PC **A05**/MF **A01**

NTIS ORDER/REPORT NUMBER INDEX

N81-29500/8
Soil Moisture Inferences from Thermal Infrared Measurements of Vegetation Temperatures.
N81-29500/8 1169 PC **A02**/MF **A01**

N81-29501/6
Conversion of Spu-Universal Disk File to Jsc-Universal Tape Storage: Convrt User's Guide.
N81-29501/6 1174 PC **A02**/MF **A01**

N81-29502/4
Maximum Likelihood Clustering with Dependent Feature Trees.
N81-29502/4 1198 PC **A04**/MF **A01**

N81-29503/2
New Output Improvements for Classy.
N81-29503/2 1080 PC **A03**/MF **A01**

N81-29504/0
Users Manual for the US Baseline Corn and Soybean Segment Classification Procedure.
N81-29504/0 1080 PC **A12**/MF **A01**

N81-29505/7
The Environmental Vegetation Index: A Tool Potentially Useful for Arid Land Management.
N81-29505/7 1081 PC **A02**/MF **A01**

N81-29506/5
Characteristics, of Tiros, Goes, Dmsp and Landsat Systems.
N81-29506/5 1272 PC **A02**/MF **A01**

N81-29507/3
Descriptive and Sensitivity Analyses of Watbali: A Dynamic Soil Water Model.
N81-29507/3 1170 PC **A05**/MF **A01**

N81-29508/1
Evaluation of Spring Wheat and Barley Crop Calender Models for the 1979 Crop Year.
N81-29508/1 1081 PC **A03**/MF **A01**

N81-29509/9
Computer Program Documentation User Information for the Rso-Tape Print Program (Rsoprnt).
N81-29509/9 1174 PC **A02**/MF **A01**

N81-29510/7
Estimation of Proportions in Mixed Pixels Through Their Region Characterization.
N81-29510/7 1198 PC **A03**/MF **A01**

N81-29511/5
Evaluation of Large Area Crop Estimation Techniques Using Landsat and Ground-Derived Data.
N81-29511/5 1081 PC **A06**/MF **A01**

N82-10106/4
Radiative Cooler.
PAT-APPL-6-284 289 1201 PC **A02**/MF **A01**

N82-10227/8
Method of Neutralizing the Corrosive Surface of Amine-Cured Epoxy Resins.
PAT-APPL-6-293 412 1195 PC **A02**/MF **A01**

N82-10228/6
High Temperature Glass Thermal Control Structure and Coating.
PAT-APPL-6-308 007 1190 PC **A02**/MF **A01**

N82-10286/4
Synthetic Aperture Radar Target Simulator.
PAT-APPL-6-284 287 1238 PC **A02**/MF **A01**

N82-10287/2
Focal Axis Resolver for Offset Reflector Antennas.
PAT-APPL-6-308 009 1179 PC **A02**/MF **A01**

N82-10324/3
Tuned Analog Network.
PAT-APPL-6-301 077 1179 PC **A02**/MF **A01**

N82-10356/1
Cooling by Conversion of Para to Ortho-Hydrogen.
PAT-APPL-6-301 075 1152 PC **A02**/MF **A01**

N82-10359/9
Gas Levitator and Method for Containerless Processing.
PAT-APPL-6-297 486 1224 PC **A02**/MF **A01**

N82-10360/7
Improved Constant-Output Atomizer.
PAT-APPL-6-308 203 1225 PC **A02**/MF **A01**

N82-10390/4
Active Lamp Pulse Driver Circuit.
PAT-APPL-6-276 748 1179 PC **A02**/MF **A01**

N82-10496/9
Solar Energy Modulator.
PAT-APPL-6-284 286 1183 PC **A02**/MF **A01**

N82-10862/2
Real-Time 3D X-Ray and gamma-Ray Viewer.
PAT-APPL-6-267 178 1179 PC **A02**/MF **A01**

N82-11013/1
Effects of Vortex Flaps on the Low-Speed Aerodynamic Characteristics of an Arrow Wing.
N82-11013/1 1077 PC **A04**/MF **A01**

N82-11018/0
Algorithm for Fuel Conservative Horizontal Capture Trajectories.
N82-11018/0 1076 PC **A03**/MF **A01**

N82-11031/3
Analytical and Experimental Study of Flow Phenomena in Noncavitating Rocket Pump Inducers.
N82-11031/3 1270 PC **A06**/MF **A01**

N82-11032/1
Some Observations on a New Numerical Method for Solving Navier-Stokes Equations.
N82-11032/1 1254 PC **A02**/MF **A01**

N82-11033/9
Wind-Tunnel Results for a Modified 17-Percent-Thick Low-Speed Airfoil Section.
N82-11033/9 1076 PC **A05**/MF **A01**

N82-11034/7
New Estimation Method for Flutter or Divergence Boundary from Random Responses at Subcritical Speeds.
N82-11034/7 1077 PC **A02**/MF **A01**

N82-11035/4
A Study on Numerical Method for Evaluating Spanwise Integral in Subsonic Lifting-Surface Theory.
N82-11035/4 1076 PC **A02**/MF **A01**

N82-11036/2
A Wake Source Model for Asymmetric Potential Flow past Bodies of Wedge Shape.
N82-11036/2 1254 PC **A04**/MF **A01**

N82-11037/0
A Wake Source Model for Non-Symmetric Flow past Bluff Bodies in Two-Dimensional Flow.
N82-11037/0 1076 PC **A03**/MF **A01**

N82-11038/8
Generation of Axi-Symmetric Body Shapes in Subsonic Flow by Means of Polynomial Distributions of Sources and Doublets Along the Axis of Symmetry.
N82-11038/8 1254 PC **A04**/MF **A01**

N82-11039/6
Aircraft Wing Trailing-Edge Noise.
N82-11039/6 1076 PC **A07**/MF **A01**

N82-11040/4
Space Shuttle Solid Rocket Booster Sting Interference Wind Tunnel Test Analysis.
N82-11040/4 1272 PC **A11**/MF **A01**

N82-11041/2
Calculations of Transonic Potential Flow over Cascades.
N82-11041/2 1270 PC **A03**/MF **A01**

N82-11042/0
Low Speed Testing of the Inlets Designed for a Tamden-Fan V/STOL Nacelle.
N82-11042/0 1077 PC **A02**/MF **A01**

N82-11043/8
A Summary of V/STOL Inlet Analysis Methods.
N82-11043/8 1077 PC **A02**/MF **A01**

N82-11046/1
Computation of High Reynolds Number Internal/External Flows.
N82-11046/1 1254 PC **A02**/MF **A01**

N82-11050/3
Parametric Study of Microwave-Powered High-Altitude Airplane Platforms Designed for Linear Flight.
N82-11050/3 1077 PC **A04**/MF **A01**

N82-11051/1
The Effects of Lateral Aerodynamic Uncertainties on the Handling Qualities of the Space Shuttle Orbiter at Mach Numbers of 1.5 and .6.
N82-11051/1 1272 PC **A03**/MF **A01**

N82-11052/9
Icing Tunnel Tests of a Composite Porous Leading Edge for Use with a Liquid Anti-Ice System.
N82-11052/9 1078 PC **A02**/MF **A01**

N82-11053/7
Selected Bibliography of Naca-NASA Aircraft Icing Publications.
N82-11053/7 1078 PC **E15**/MF **A01**

N82-11054/5
A Comparison of Theoretical and Experimental Pressure Distributions for Two Advanced Fighter Wings.
N82-11054/5 1078 PC **A05**/MF **A01**

N82-11067/7
New Molding Method of Three-Dimensional Hollow Photoelastic Model and Centrifugal Stress Analysis of Air Cooled Turbine Blade Model.
N82-11067/7 1270 PC **A02**/MF **A01**

N82-11068/5
Lightweight Diesel Engine Designs for Commuter Type Aircraft.
N82-11068/5 1271 PC **A04**/MF **A01**

N82-11070/1
An Influence Coefficient Method for the Application of the Modal Technique to Wing Flutter Suppression of the Dast Arw-1 Wing.
N82-11070/1 1078 PC **A03**/MF **A01**

N82-11071/9
Aeroacoustic Theory for Noncompact Wing-Gust Interaction.
N82-11071/9 1078 PC **A06**/MF **A01**

N82-11090/9
An Algorithm for Minimum-Cost Set-Point Ordering in a Cryogenic Wind Tunnel.
N82-11090/9 1228 PC **A03**/MF **A01**

N82-11093/3
Technology for Large Space Systems: A Special Bibliography.
N82-11093/3 1272 PC **A06**

N82-11094/1
Space Processing of Electronic Materials.
N82-11094/1 1222 PC **A02**/MF **A01**

N82-11095/8
A Proposed New Policy for Planetary Protection.
N82-11095/8 1272 PC **A05**/MF **A01**

N82-11097/4
Hungarian Cosmonaut in Space.
N82-11097/4 1272 PC **A05**/MF **A01**

N82-11098/2
Nonparametric Identification of a Class of Nonlinear Close-Coupled Dynamic Systems.
N82-11098/2 1272 PC **A05**/MF **A01**

N82-11099/0
Parameter Estimation of Large Flexible Aerospace Structures with Application to the Control of the Maypole Deployable Reflector.
N82-11099/0 1272 PC **A02**/MF **A01**

N82-11100/6
On the Shape and Orientation Control of an Orbiting Shallow Spherical Shell Structure.
N82-11100/6 1272 PC **A02**/MF **A01**

N82-11101/4
ATS-5 12 Year in Orbit Evaluation.
N82-11101/4 1272 PC **A07**/MF **A01**

N82-11102/2
Mission Operation Report: Rca-D/delta Launch.
N82-11102/2 1273 PC **A03**/MF **A01**

N82-11103/0
Magnetic Field Satellite (MAGSAT) Data Processing System Specifications.
N82-11103/0 1174 PC **A07**/MF **A01**

N82-11105/5
Magnetic Field Investigation for ISEE Mother and Daughter Spacecraft.
N82-11105/5 1228 PC **A02**/MF **A01**

N82-11106/3
Testing of a Spacecraft Model in a Combined Environment Simulator.
N82-11106/3 1273 PC **A02**/MF **A01**

N82-11107/1
Voltage Gradients in Solar Array Cavities as Possible Breakdown Sites in Spacecraft-Charging-Induced Discharges.
N82-11107/1 1186 PC **A02**/MF **A01**

N82-11109/7
Concept for a Power System Controller for Large Space Electrical Power Systems.
N82-11109/7 1177 PC **A02**/MF **A01**

N82-11110/5
Study of Electrical and Chemical Propulsion Systems for Auxiliary Propulsion of Large Space Systems. Volume 1: Executive Summary.
N82-11110/5 1271 PC **A03**/MF **A01**

N82-11111/3
Study of Electrical and Chemical Propulsion Systems for Auxiliary Propulsion of Large Space Systems, Volume 2.
N82-11111/3 1271 PC **A23**/MF **A01**

N82-11116/2
Radiation Testing of Composite Materials, in Situ Versus Ex Situ Effects.
N82-11116/2 1190 PC **A06**/MF **A01**

N82-11117/0
Novel Improved PMR Polyimides.
N82-11117/0 1190 PC **A02**/MF **A01**

N82-11119/6
The Industrial Processing of Unidirectional Fiber Prepregs.
N82-11119/6 1191 PC **A02**/MF **A01**

N82-11120/4
Silicon Carbide as an Oxidation-Resistant High-Temperature Material. 1: Oxidation and Heat Corrosion Behavior.
N82-11120/4 1189 PC **A00**

N82-11121/2
Optical Fiber Interferometer for the Study of Ultrasonic Waves in Composite Materials.
N82-11121/2 1191 PC **A06**/MF **A01**

N82-11145/1
Coal Desulfurization by Low Temperature Chlorinolysis, Phase 3.
N82-11145/1 1209 PC **A08**/MF **A01**

N82-11146/9
Assessment of Advanced Coal Gasification Processes.
N82-11146/9 1147 PC **A09**/MF **A01**

N82-11181/6
Flaw Growth of 7075, 7475, 7050 and 7049 Aluminum Alloy Plate in Stress Corrosion Environments: 4-Year Marine Atmosphere Results.
N82-11181/6 1192 PC **A04**/MF **A01**

N82-11182/4
Trends in High Temperature Gas Turbine Materials.
N82-11182/4 1193 PC **A02**/MF **A01**

N82-11183/2
Universal Binding Energy Relations in Metallic Adhesion.
N82-11183/2 1189 PC **A02**/MF **A01**

N82-11184/0
Failure Analysis of a Tool Steel Torque Shaft.
N82-11184/0 1193 PC **A02/MF A01**

N82-11207/9
Evaluation of the Effects of Solar Radiation on Glasses.
N82-11207/9 1256 PC **A04/MF A01**

N82-11208/7
The Stability of New Transparent Polymeric Materials: The Epoxy Trimethoxyboroxine System. Part 1: The Preparation, Characterization and Curing of Epoxy Resins and Their Copolymers.
N82-11208/7 1195 PC **A04/MF A01**

N82-11209/5
Fracture Mechanics of Cellular Glass.
N82-11209/5 1189 PC **A04/MF A01**

N82-11211/1
Fabrication and Wear Test of a Continuous Fiber/Particulate Composite Total Surface Hip Replacement.
N82-11211/1 1140 PC **A03/MF A01**

N82-11223/6
Technical and Economic Aspect of Hydrogen Storage in Metal Hydrides.
N82-11223/6 268 PC **A03/MF A01**

N82-11224/4
Experimental Study of Fuel Heating at Low Temperatures in a Wing Tank Model, Volume 1.
N82-11224/4 1268 PC **A04/MF A01**

N82-11225/1
The Storage of Hydrogen in the Form of Metal Hydrides: An Application to Thermal Engines.
N82-11225/1 1269 PC **A03/MF A01**

N82-11277/2
Standard Specification for Light Ladders.
N82-11277/2 1218 PC **A03/MF A01**

N82-11278/0
Standard Specification for Industrial Safety-Belt Assemblies.
N82-11278/0 1225 PC **A02/MF A01**

N82-11279/8
The Telecommunications and Data Acquisition Report.
N82-11279/8 1234 PC **A11/MF A01**

N82-11311/9
Firefighting Module Development.
N82-11311/9 1225 PC **A05/MF A01**

N82-11337/4
Design Methodology and Development History of an ISO OSI Layered Architecture for the Canadian Broadcast Telidon System.
N82-11337/4 1234 PC **A02/MF A01**

N82-11338/2
Antenna Pattern Modification for Single Reflector Antennas.
N82-11338/2 1264 PC **A04/MF A01**

N82-11339/0
General Aviation Aircraft Antennas for the Global Positioning System.
N82-11339/0 1237 PC **A03/MF A01**

N82-11340/8
Telecommunications in Cometary Environments.
N82-11340/8 1234 PC **A03/MF A01**

N82-11341/6
Modulation/Demodulation Techniques for Satellite Communications. Part 4: Appendices.
N82-11341/6 1234 PC **A05/MF A01**

N82-11358/0
Application of a Rare-Earth Cobalt Magnet to Synchronous Motors.
N82-11358/0 1171 PC **A02/MF A01**

N82-11390/3
Surface-Tension Induced Instabilities: Effects of Lateral Boundaries.
N82-11390/3 1262 PC **A07/MF A01**

N82-11391/1
Amplified Crossflow Disturbances in the Laminar Boundary Layer on Swept Wings with Suction.
N82-11391/1 1078 PC **A05/MF A01**

N82-11393/7
A Three-Dimensional Simulation of Transition and Early Turbulence in a Time-Developing Mixing Layer.
N82-11393/7 1254 PC **A07/MF A01**

N82-11394/5
Mixing of a Passive Scalar in Isotropic and Sheared Homogeneous Turbulence.
N82-11394/5 1254 PC **A08/MF A01**

N82-11395/2
Higher-Level Simulations of Turbulent Flows.
N82-11395/2 1254 PC **A08/MF A01**

N82-11396/0
Numerical Simulation of a Compressible Homogeneous, Turbulent Shear Flow.
N82-11396/0 1254 PC **A09/MF A01**

N82-11397/8
Lewis Research Center's Coal-Fired, Pressurized, Fluidized-Bed Reactor Test Facility.
N82-11397/8 1265 PC **A03/MF A01**

N82-11398/6
A Computer Solution to the Stationary Navier-Stokes Equations in Two Dimensions with Proven Convergence.
N82-11398/6 1254 PC **A02/MF A01**

N82-11433/1
Standard Specification for Apparatus for gamma Radiography.
N82-11433/1 1228 PC **A02/MF A01**

N82-11434/9
Dynamic Moire Methods for Detection of Loosened Space Shuttle Tiles.
N82-11434/9 1273 PC **A02/MF A01**

N82-11435/6
Low-Cost Solar Array Project: Four Absolute Cavity Radiometer (Pyrheliometer) Intercomparisons at New River, Arizona: Radiometer Standards.
N82-11435/6 1228 PC **A10/MF A01**

N82-11452/1
InGaAsP/InP Laser Development for Single-Mode, High-Data-Rate Communications.
N82-11452/1 1255 PC **A04/MF A01**

N82-11453/9
Development of MBE Grown Pb-Salt Semiconductor Lasers for the 8.0 to 15.0 Micrometer Spectral Region.
N82-11453/9 1255 PC **A05/MF A01**

N82-11464/6
Standard Specification for Air-Brake Reservoirs.
N82-11464/6 1220 PC **A02/MF A01**

N82-11465/3
Advanced Superposition Methods for High Speed Turbopump Vibration Analysis.
N82-11465/3 1225 PC **A05/MF A01**

N82-11466/1
Preliminary Study of Temperature Measurement Techniques for Stirling Engine Reciprocating Seals.
N82-11466/1 1271 PC **A05/MF A01**

N82-11467/9
JT8D High Pressure Compressor Performance Improvement.
N82-11467/9 1270 PC **A03/MF A01**

N82-11468/7
Liquid Oxygen Turbopump Technology.
N82-11468/7 1225 PC **A12/MF A01**

N82-11488/5
An Improved Transverse Shear Deformation Theory for Laminated Antisotropic Plates.
N82-11488/5 1262 PC **A03/MF A01**

N82-11489/3
Research in Nonlinear Structural and Solid Mechanics.
N82-11489/3 1262 PC **A03/MF A01**

N82-11490/1
Modal Analysis Using a Fourier Analyzer, Curve-Fitting, and Modal Tuning.
N82-11490/1 1262 PC **A03/MF A01**

N82-11491/9
Integrated Analysis of Engine.
N82-11491/9 1078 PC **A02/MF A01**

N82-11492/7
A Review of an Attempt to Create Shatter Cones with Magnetic Flyer Plate Technology.
N82-11492/7 1158 PC **A04/MF A01**

N82-11493/5
Study of Foldable Elastic Tubes for Large Space Structure Applications, Phase 3.
N82-11493/5 1273 PC **A03/MF A01**

N82-11510/6
A Model Describing the Microwave Emission from a Multi-Layer Snowpack at 37 Ghz.
N82-11510/6 1169 PC **A07/MF A01**

N82-11511/4
Development of the Coastal Zone Color Scanner for Nimbus 7. Volume 1: Mission Objectives and Instrument Description.
N82-11511/4 1228 PC **A05/MF A01**

N82-11512/2
SMMR Data Set Development for GARP.
N82-11512/2 1085 PC **A04/MF A01**

N82-11513/0
An Evaluation of the Spatial Resolution of Soil Moisture Information.
N82-11513/0 1170 PC **A05/MF A01**

N82-11514/8
Radar Mapping, Archaeology, and Ancient Land Use in the Maya Lowlands.
N82-11514/8 1104 PC **A03/MF A01**

N82-11515/5
Technology Transfer of NASA Microwave Remote Sensing System.
N82-11515/5 1228 PC **A03/MF A01**

N82-11516/3
Geologic Considerations in Underground Coal Mining System Design.
N82-11516/3 1166 PC **A04/MF A01**

N82-11544/5
Investigation of Direct Solar-to-Microwave Energy Conversion Techniques.
N82-11544/5 1186 PC **A06/MF A01**

N82-11545/2
Survey on Aging on Electrodes and Electrocatalysts in Phosphoric Acid Fuel Cells.
N82-11545/2 1186 PC **A04/MF A01**

N82-11546/0
Processing of Silicon Solar Cells by Ion Implantation and Laser Annealing.
N82-11546/0 1186 PC **A05/MF A01**

N82-11548/6
The Effects of Impurities on the Performance of Silicon Solar Cells.
N82-11548/6 1187 PC **A04/MF A01**

N82-11549/4
Irrigation Market for Solar Thermal Parabolic Dish Systems.
N82-11549/4 1182 PC **A03/MF A01**

N82-11550/2
Secondary and Compound Concentrators for Parabolic Dish Solar Thermal Power Systems.
N82-11550/2 1182 PC **A03/MF A01**

N82-11551/0
Solar Cell Development for the Power Extension Package.
N82-11551/0 1187 PC **A02/MF A01**

N82-11635/1
Shuttle Applications in Tropospheric Air Quality Observations.
N82-11635/1 1209 PC **A06/MF A01**

N82-11636/9
Effects of Aircraft Noise on the Equilibrium of Airport Residents: Testing and Utilization of a New Methodology.
N82-11636/9 1112 PC **A03/MF A01**

N82-11688/0
Improved Simulation of Aerosol, Cloud, and Density Measurements by Shuttle Lidar.
N82-11688/0 1085 PC **A08/MF A01**

N82-11690/6
Variations in Atmospheric Angular Momentum.
N82-11690/6 1085 PC **A03/MF A01**

N82-11691/4
Workshop on Early Crustal Genesis: Implications from Earth.
N82-11691/4 1158 PC **A03/MF A01**

N82-11693/0
Geomagnetic Observations.
N82-11693/0 1085 PC **A04/MF A01**

N82-11694/8
Hotspots, Polar Wander, Mesozoic Convection and the Geoid.
N82-11694/8 1158 PC **A02/MF A01**

N82-11695/5
Crustal Deformation and Seismic Measurements in the Region of Mcdonald Observatory, West Texas.
N82-11695/5 1169 PC **A07/MF A01**

N82-11696/3
Study of the Time Evolution of the Lithosphere.
N82-11696/3 1157 PC **A02/MF A01**

N82-11697/1
Meridional Heat Transport at the Onset of Winter Stratospheric Warming.
N82-11697/1 1085 PC **A02/MF A01**

N82-11698/9
Far-Infrared Measurements of Trace Gases.
N82-11698/9 1228 PC **A02/MF A01**

N82-11723/5
Time-Variable Earth's Albedo Model Characteristics and Applications to Satellite Sampling Errors.
N82-11723/5 1085 PC **A05/MF A01**

N82-11724/3
Some Analysis on the Diurnal Variation of Rainfall over the Atlantic Ocean.
N82-11724/3 1087 PC **A04/MF A01**

N82-11725/0
Evaluation of Photogrammetric Flight under Icing Conditions on March 23, 1978.
N82-11725/0 1087 PC **A03/MF A01**

N82-11757/3
Cyclic Nucleotides in Tissues During Long-Term Hypokinesia.
N82-11757/3 1144 PC **A02/MF A01**

N82-11758/1
Laser Induced Fluoroescence from Algae: Results of a Ship-Borne Field Test.
N82-11758/1 1121 PC **A03/MF A01**

N82-11759/9
Electron Microscopical and Histochemical Studies on the Transverse Striated Muscles of Birds after Prolonged Hypokinesis.
N82-11759/9 1144 PC **A02/MF A01**

N82-11760/7
Participation of the Hypophyseal-Adrenal Cortex System in Thrombin Clearance During Immobilization Stress.
N82-11760/7 1144 PC **A02/MF A01**

N82-11771/4
Effects of Curative Treatment Emphasizing Endurance Training on the Performance and Blood Pressure of Hypertensive and Normotensives.
N82-11771/4 1144 PC **A02/MF A01**

N82-11784/7
Space Shuttle Main Engine Controller.

N82-11784/7 1273 PC **A03**/MF **A01**

N82-11800/1
Thermal Algorithms Analysis.
N82-11800/1 1174 PC **A02**/MF **A01**

N82-11801/9
SAR Processing on the MPP.
N82-11801/9 1174 PC **A05**/MF **A01**

N82-11816/7
SPAR Data Set Contents.
N82-11816/7 1273 PC **A03**/MF **A01**

N82-11817/5
Comparisons of Some Large Scientific Computers.
N82-11817/5 1174 PC **A03**/MF **A01**

N82-11826/6
A Second-Order Accurate Procedure for Solving the Boundary Layer Equations Based on the Predictor-Corrector Form of the Crank-Nicolson Scheme.
N82-11826/6 1198 PC **A02**/MF **A01**

N82-11833/2
Methods for Presentation and Display of Multivariate Data.
N82-11833/2 1198 PC **A02**/MF **A01**

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Applications of Non-Parametric Statistics and Analysis of Variance on Sample Variances.
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Handbook for Industrial Noise Control.
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N82-11859/7
Helicopter Rotor Trailing Edge Noise.
N82-11859/7 1078 PC **A07**/MF **A01**

N82-11860/5
SEL and EPNL Noise Duration Coefficients for the 747 and T-38 Aircraft.
N82-11860/5 1078 PC **A02**/MF **A01**

N82-11862/1
Digital Ultrasonics Signal Processing: Flaw Data Post Processing Use and Description.
N82-11862/1 1228 PC **A07**/MF **A01**

N82-11889/4
Analysis of Space Systems Study for the Space Disposal of Nuclear Waste Study Report. Volume 2: Technical Report.
N82-11889/4 1245 PC **A16**/MF **A01**

N82-11924/9
Theory of Drift Instabilities and the Associated Anomalous Transport.
N82-11924/9 1240 PC **A07**/MF **A01**

N82-11925/6
Least Squares Autoregressive (Maximum Entropy) Spectral Estimation for Fourier Spectroscopy and Its Application to the Electron Cyclotron Emission from Plasma.
N82-11925/6 1261 PC **A03**/MF **A01**

N82-11926/4
An Energy Integral and Variational Principle for Plasma Kinetic Modes.
N82-11926/4 1261 PC **A02**/MF **A01**

N82-11927/2
Charge Transfer in Collisions of Li-3(+) And Be-4(+) Ions with Atomic Hydrogen at Low Impact Energy.
N82-11927/2 1152 PC **A02**/MF **A01**

N82-11928/0
Oblique Propagation of Electron Thermal Modes Below the Electron Plasma Frequency Without Boundary Effects.
N82-11928/0 1261 PC **A02**/MF **A01**

N82-11929/8
Boosting Up of Neutral Beam Heating Power by Slowly Rising Toroidal Field.
N82-11929/8 1240 PC **A03**/MF **A01**

N82-11958/7
Growth of Solid Solution Single Crystals.
N82-11958/7 1253 PC **A02**/MF **A01**

N82-11959/5
Low Temperature Growth and Electrical Characterization of Insulators for GaAs MISFETS.
N82-11959/5 1171 PC **A02**/MF **A01**

N82-11961/9
Nasa Patent Abstracts Bibliography: A Continuing Bibliography, Section 1, Abstracts. Supplement 19.
N82-11981/9 1095 PC **E03**

N82-11962/7
Nasa Patent Abstracts Bibliography: A Continuing Bibliography, Section 2, Indexes. Supplement 19.
N82-11982/7 1095 PC **E05**

N82-11989/2
Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.
N82-11989/2 1103 PC **A03**/MF **A01**

N82-11991/8
Automated Water Monitor System Field Demonstration Test Report. Volume 1: Executive Summary.
N82-11991/8 1209 PC **A03**/MF **A01**

N82-11992/6
Automated Water Monitor System Field Demonstration Test Report. Volume 2: Technical Summary.
N82-11992/6 1209 PC **A14**/MF **A01**

N82-11993/4
Jet Impingement Heat Transfer Enhancement for the GPU-3 Stirling Engine.
N82-11993/4 1271 PC **A03**/MF **A01**

N82-11994/2
Evaluation of the Micro-Carburetor.
N82-11994/2 1271 PC **A05**/MF **A01**

N82-12004/9
Theoretical Studies of Chromospheres and Winds in Cool Stars.
N82-12004/9 1082 PC **A02**/MF **A01**

N82-12010/6
Computation of Averaged Monthly Zonal Albedo Utilizing the Solar Zenith Angle, Properties of Clear and Cloudy Atmospheres.
N82-12010/6 1082 PC **A05**/MF **A01**

N82-12015/5
Radiative Transfer in Cometary Dust Atmospheres: Critique of Recent Developments.
N82-12015/5 1083 PC **A02**/MF **A01**

N82-12016/3
Radiation Balances and the Solar Constant.
N82-12016/3 1085 PC **A02**/MF **A01**

N82-12020/5
A Review and Interpretation of Recent Cosmic Ray Beryllium Isotope Measurements.
N82-12020/5 1083 PC **A03**/MF **A01**

NADC-78241-60
Study of Graphite/Epoxy Composites for Material Flaw Criticality.
AD-A107 391/5 1190 PC **A07**/MF **A01**

NADC-81226-60
Development of Automatic Inflation Devices for Life Preservers.
AD-A107 107/5 1140 PC **A10**/MF **A01**

NAL-TR-427T
New Molding Method of Three-Dimensional Hollow Photoelastic Model and Centrifugal Stress Analysis of Air Cooled Turbine Blade Model.
N82-11067/7 1270 PC **A02**/MF **A01**

NAL-TR-655
A Second-Order Accurate Procedure for Solving the Boundary Layer Equations Based on the Predictor-Corrector Form of the Crank-Nicolson Scheme.
N82-11826/6 1198 PC **A02**/MF **A01**

NAL-TR-656
Application of a Rare-Earth Cobalt Magnet to Synchronous Motors.
N82-11358/0 1171 PC **A02**/MF **A01**

NAL-TR-661T
A Study on Numerical Method for Evaluating Spanwise Integral in Subsonic Lifting-Surface Theory.
N82-11035/4 1076 PC **A02**/MF **A01**

NAL-TR-667T
New Estimation Method for Flutter or Divergence Boundary from Random Responses at Subcritical Speeds.
N82-11034/7 1077 PC **A02**/MF **A01**

NASA-CASE-ARC-11164-1
High Temperature Glass Thermal Control Structure and Coating.
PAT-APPL-6-308 007 1190 PC **A02**/MF **A01**

NASA-CASE-GSC-12566-1
Active Lamp Pulse Driver Circuit.
PAT-APPL-6-276 748 1179 PC **A02**/MF **A01**

NASA-CASE-GSC-12630-1
Focal Axis Resolver for Offset Reflector Antennas.
PAT-APPL-6-308 009 1179 PC **A02**/MF **A01**

NASA-CASE-GSC-12640-1
Real-Time 3D X-Ray and gamma-Ray Viewer.
PAT-APPL-6-267 178 1179 PC **A02**/MF **A01**

NASA-CASE-GSC-12650-1
Tuned Analog Network.
PAT-APPL-6-301 077 1179 PC **A02**/MF **A01**

NASA-CASE-GSC-12686-1
Method of Neutralizing the Corrosive Surface of Amine-Cured Epoxy Resins.
PAT-APPL-6-293 412 1195 PC **A02**/MF **A01**

NASA-CASE-GSC-12770-1
Cooling by Conversion of Para to Ortho-Hydrogen.
PAT-APPL-6-301 075 1152 PC **A02**/MF **A01**

NASA-CASE-MFS-25509-1
Gas Levitator and Method for Containerless Processing.
PAT-APPL-6-297 486 1224 PC **A02**/MF **A01**

NASA-CASE-MFS-25631-1
Improved Constant-Output Atomizer.
PAT-APPL-6-308 203 1225 PC **A02**/MF **A01**

NASA-CASE-NPO-15024-1
Synthetic Aperture Radar Target Simulator.
PAT-APPL-6-284 287 1238 PC **A02**/MF **A01**

NASA-CASE-NPO-15388-1
Solar Energy Modulator.
PAT-APPL-6-284 286 1183 PC **A02**/MF **A01**

NASA-CASE-NPO-15465-1
Radiative Cooler.
PAT-APPL-6-284 289 1201 PC **A02**/MF **A01**

NASA-CP-2147-SUP
Research in Nonlinear Structural and Solid Mechanics.
N82-11489/3 1262 PC **A03**/MF **A01**

NASA-CR-3470
Helicopter Rotor Trailing Edge Noise.
N82-11859/7 1078 PC **A07**/MF **A01**

NASA-CR-3471
Analytical and Experimental Study of Flow Phenomena in Noncavitating Rocket Pump Inducers.
N82-11031/3 1270 PC **A06**/MF **A01**

NASA-CR-3473
Improved Simulation of Aerosol, Cloud, and Density Measurements by Shuttle Lidar.
N82-11688/0 1085 PC **A08**/MF **A01**

NASA-CR-3475
Radiation Testing of Composite Materials, in Situ Versus Ex Situ Effects.
N82-11116/2 1190 PC **A06**/MF **A01**

NASA-CR-3477
InGaAsP/InP Laser Development for Single-Mode, High-Data-Rate Communications.
N82-11452/1 1255 PC **A04**/MF **A01**

NASA-CR-16516
Catalytic Combustion with Incompletely Vaporized Residual Fuel.
DE82000419 1265 PC **A04**/MF **A01**

NASA-CR-145374
Shuttle Applications in Tropospheric Air Quality Observations.
N82-11635/1 1209 PC **A06**/MF **A01**

NASA-CR-160938
Conversion of Spu-Universal Disk File to Jsc-Universal Tape Storage: Convrt User's Guide.
N81-29501/6 1174 PC **A02**/MF **A01**

NASA-CR-160939
Maximum Likelihood Clustering with Dependent Feature Trees.
N81-29502/4 1198 PC **A04**/MF **A01**

NASA-CR-160949
Nationwide Forestry Applications Program. Analysis of Forest Classification Accuracy.
N81-29499/3 1081 PC **A05**/MF **A01**

NASA-CR-160954
Soil Moisture Inferences from Thermal Infrared Measurements of Vegetation Temperatures.
N81-29500/8 1169 PC **A02**/MF **A01**

NASA-CR-160965
The Multicategory Case of the Sequential Bayesian Pixel Selection and Estimation Procedure.
N81-29498/5 1198 PC **A02**/MF **A01**

NASA-CR-160966
Evaluation of Gravimetric Ground Truth Soil Moisture Data Collected for the Agricultural Soil Moisture Experiment, 1978 Colby, Kansas, Aircraft Mission.
N81-29494/4 1169 PC **A14**/MF **A01**

NASA-CR-160974
New Output Improvements for Classy.
N81-29503/2 1080 PC **A03**/MF **A01**

NASA-CR-160975
Users Manual for the US Baseline Corn and Soybean Segment Classification Procedure.
N81-29504/0 1080 PC **A12**/MF **A01**

NASA-CR-160977
Evaluation of Spring Wheat and Barley Crop Calender Models for the 1979 Crop Year.
N81-29508/1 1081 PC **A03**/MF **A01**

NASA-CR-160978
The Environmental Vegetation Index: A Tool Potentially Useful for Arid Land Management.
N81-29505/7 1081 PC **A02**/MF **A01**

NASA-CR-160979
Characteristics, of Tiros, Goes, Dmsp and Landsat Systems.
N81-29506/5 1272 PC **A02**/MF **A01**

NASA-CR-160980
Descriptive and Sensitivity Analyses of Watbali: A Dynamic Soil Water Model.
N81-29507/3 1170 PC **A05**/MF **A01**

NASA-CR-160984
An Analysis of Haze Effects on Landsat Multispectral Scanner Data.
N81-29497/7 1080 PC **A03**/MF **A01**

NASA-CR-160998
Evaluation of Large Area Crop Estimation Techniques Using Landsat and Ground-Derived Data.
N81-29511/5 1081 PC **A06**/MF **A01**

NASA-CR-161000
Computer Program Documentation User Information for the Rso-Tape Print Program (Rsoprnt).
N81-29509/9 1174 PC **A02**/MF **A01**

NASA-CR-161001
Estimation of Proportions in Mixed Pixels Through Their Region Characterization.
N81-29510/7 1198 PC **A03**/MF **A01**

NASA-CR-161004
Development of Advanced Acreage Estimation Methods.
N81-29495/1 1156 PC **A07**/MF **A01**

NASA-CR-161882
Digital Ultrasonics Signal Processing: Flaw Data Post Processing Use and Description.
N82-11862/1 1228 PC **A07/MF A01**

NASA-CR-161883
Investigation of Direct Solar-to-Microwave Energy Conversion Techniques.
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PB82-135609 1226 PC **A02**/MF **A01**

NBSIR-81-2336
Consumer Representation in Standards Development: Literature Review and Issue Identification.
PB82-135880 1093 PC **A05**/MF **A01**

NBSIR-81-2353
Documentation of Program for Determination of Conduction Transfer Functions,
PB82-136284 1226 PC **A03**/MF **A01**

NBSIR-81-2377
Effects of Time-Varying Noise on Annoyance: A Review,
PB82-133513 1112 PC **A04**/MF **A01**

NBSIR-81-2381
Solar Industrial Process Heat Systems - An Assessment of Standards for Materials and Components,
PB82-133703 1202 PC **A05**/MF **A01**

NBSIR-81-2388
Synopsis of Interviews from a Survey of Software Tool Usage,
PB82-133521 1175 PC **A05**/MF **A01**

NCEI-0018
Support Services for Commercialization of Small Hydroelectric Facilities in North Carolina.
NCEI-0018 1186 PC **A10**/MF **A01**

NCHSR-81-171
Methods for Evaluating Costs of Automated Hospital Information Systems.
PB82-134073 1096 PC **A04**/MF **A01**

NCHSR-81-179
Optimal Control of a Network of Whole Blood Banks: Target Inventory Levels for a Hospital Blood Bank or a Decentralized Regional Blood Banking System.
PB82-106816 1130 PC **A03**/MF **A01**

NCHSR-81-223
A Profile of the Medical Technology Industry and Governmental Policies. Volume I.
PB82-141821 1100 PC **A11**/MF **A01**

NCHSR-81-224
A Profile of the Medical Technology Industry and Governmental Policies: A Study of the Effects of Medicare/Medicaid Reimbursement and the 1976 Medical Device Amendments on the Pacemaker Industry. Volume II.
PB82-141839 1100 PC **A05**/MF **A01**

NCHSR-81-225
A Profile of the Medical Technology Industry and Governmental Policies. Appendix A: Review and Assessment of Secondary Data Sources for Developing a Profile of the Medical Technology Industry.
PB82-141847 1141 PC **A06**/MF **A01**

NCHSR-81-232
Synthesis of Recent Research on Medical Career Decisions: A Comparative Study of Physicians from Two Decades. Executive Summary and Final Report.
PB82-133737 1110 PC **A14**/MF **A01**

NCI/ICRDB/SL-455
Selected Aspects of Cancer-Related Proteins, Carbohydrate, Lipid, and Other Biochemistry.
PB81-929905 1120 Not available NTIS

NCSC-TM-327-81
Carbon Dioxide Absorption Characteristics of High Performance Sodasorb at 1 Atmosphere.
AD-A107 488/9 1140 PC **A02**/MF **A01**

NDRE/PUBL-81/1001
Neurotransmitter Mechanisms in the Nucleus Accumbens Septi and Related Regions in the Rat Brain.
AD-A107 453/3 1142 PC **A06**/MF **A01**

NE-PROJ-2060591(PT.1)
Heat Storage in Ground Water. Part 1. Study of Ground Water Reservoirs.
NE-PROJ-2060591(PT.1) 1188 PC **A05**/MF **A01**

NE-PROJ-2060591(PT.2)
Heat Storage in Ground Water. Part 2. Study of Distribution Systems.
NE-PROJ-2060591(PT.2) 1188 PC **A04**/MF **A01**

NEI-80-301
Anatomy and Assessment of Program Planning at the National Eye Institute,
PB82-107889 1091 PC **A06**/MF **A01**

NERBC/RALI-5
Strategies for State Participation in OCS Exploration Decisions: Onshore Facilities Related to Offshore Oil and Gas Development.
PB82-136482 1184 PC **A10**/MF **A01**

NIAAA/NCALI-81/20
The Marketing of Alcoholic Beverages. Phase I: Literature Report,
PB82-135286 1099 PC **A09**/MF **A01**

NIAAA/NCALI-81-21
The Marketing of Alcoholic Beverages. Phase II: An Analytical Framework for Information About Marketing Practices and Consumer Purchasing of Beverage Alcohol Products,
PB82-135278 1099 PC **A06**/MF **A01**

NIAAA/NCALI-81-22
Marketing Practices in the Alcoholic Beverages Industry: Toward an Understanding of How Macro-Environmental Forces Shape Marketing Strategies in the Alcoholic Beverage Industry. A Supplement to Phases I and II,
PB82-138579 1100 PC **A02**/MF **A01**

NIDR/CR-81-09
Comparison of the Caries-Preventive Effects of Neutral Sodium Fluoride and Acidulated Phosphate Fluoride.
PB82-135203 1132 PC **A04**/MF **A01**

NIDR/DR-81-05
Behavioral Pharmacology of Human Drug Dependence.
PB82-136961 1141 PC **A14**/MF **A01**

NIDR/DR-81-06
Benzodiazepines: A Review of Research Results, 1980.
PB82-139106 1142 PC **A06**/MF **A01**

NIH-DCRT-DMB-SSS-UG105
Project RMAG: SLANG (Structured Language) Compiler,
PB82-127267 1175 PC **A08**/MF **A01**

NIH/DF-79/006B
Project RMAG: SLANG (Structured Language) Compiler,
PB82-127267 1175 PC **A08**/MF **A01**

NIH-N01-HV-0-2093-1
Research and Development: Systems for Transmitting Energy Through the Intact Skin.
PB82-129321 1142 PC **A06**/MF **A01**

NIH/NHLBI-77-3
Patient Tracking for High Blood Pressure Control.
PB82-107525 1130 PC **A06**/MF **A01**

NIH-73-2
An Analysis of Research Publications Supported by NIH (National Institutes of Health) 1970-1976: NIH and NCI (National Cancer Institute).
PB82-108614 1130 PC **A03**/MF **A01**

NIIAR-1(360)
Shape of Prompt Neutron Spectrum from exp 252 Cf Spontaneous Fission.
NIIAR-1(360) 1260 PC **A03**/MF **A01**

NIIEFA-K-0357
Photoemulsion Method Application for Investigation of Plasma Neutron Radiation.
NIIEFA-K-0357 1261 PC **A02**/MF **A01**

NIIEFA-P-D-0411
Distributive Cathodes in Duoplasmatron Ion Sources.
NIIEFA-P-D-0411 1257 PC **A02**/MF **A01**

NIM-2110
The Investigation of a Fracture on One Side of a Skip Bridle in a Mine Shaft,
PB82-133372 1166 PC **A02**/MF **A01**

NIM-2113
Multivariable Control of a Milling Circuit at East Driefontein Gold Mine,
PB82-128729 1166 PC **A04**/MF **A01**

NIM-2121
Five Robust Indicators of Central Value,
PB82-133109 1198 PC **A02**/MF **A01**

NIM-2124
The Direct Determination, by Differential Pulse Anodic-Stripping Voltammetry at the Thin Mercury-Film Electrode, of Cadmium, Lead, and Copper,
PB82-133125 1152 PC **A03**/MF **A01**

NIMH-77-07-2
Self-Evaluation for Rape-Responsive Organizations. Volume II: A Self-Evaluation Guide for Programs Serving Victims of Rape.
PB82-110214 1130 PC **A08**/MF **A01**

NIMH-77-07-3
Self-Evaluation for Rape-Responsive Organizations. Volume III: A Self-Evaluation Guide for Rape-Responsive Community Education Programs.
PB82-110222 1131 PC **A07**/MF **A01**

NIMH-77-07-4
Self-Evaluation for Rape-Responsive Organizations. Volume IV: A Self-Evaluation Guide for Rape Responsive Training Programs.
PB82-110230 1131 PC **A03**/MF **A01**

NIMH-81-44
New England Economy Project: Case Study Summaries, Policy Analysis, and Research Methodology,
PB82-131608 1098 PC **A16**/MF **A01**

NIMH-81-45
Rape Reporting: Causes and Consequences,
PB82-133380 1114 PC **A04**/MF **A01**

NIMH-81-46
The Prevalence of Rape and Sexual Assault.
PB82-134537 1096 PC **A03**/MF **A01**

NIMH-81-47
Perception of Rape: Influence on Causal Attributions,
PB82-133778 1112 PC **A02**/MF **A01**

NIMH-81-49
Rape Response: A Research Demonstration Project,
PB82-134511 1132 PC **A03**/MF **A01**

NIMH-81-51
Evaluation of a New Community Rape Treatment Center,
PB82-133398 1132 PC **A02**/MF **A01**

NIOSH-HE-79-14-760
Health Hazard Evaluation Report No. HE-79-14-760 at General Electric Company, Evendale,Ohio,
PB82-107228 1140 PC **A02**/MF **A01**

NIOSH-HE-79-80
Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
PB82-107210 1139 PC **A02**/MF **A01**

NIOSH-HE-80-159-752
Health Hazard Evaluation Report No. HE-80-159-752 at Mountain Bell, Denver, Colorado,
PB82-107236 1140 PC **A03**/MF **A01**

NMFS-SEFC-62
Size and Sex Ratio of King Mackerel, 'Scomberomorus cavalla', in the Southeastern United States.
PB82-109406 1121 PC **A04**/MF **A01**

NOAA-TM-NWS-WR-166
Preliminary Estimates of Wind Power Potential at the Nevada Test Site.
PB82-127036 1183 PC **A02**/MF **A01**

NOAA-81073102
Size and Sex Ratio of King Mackerel, 'Scomberomorus cavalla', in the Southeastern United States.
PB82-109406 1121 PC **A04**/MF **A01**

NOAA-81100601
Evolutionary Charts of Solar Activity (Calcium Plages) as Functions of Heliographic Longitude and Time 1964-1979,
PB82-130774 1083 PC **A06**/MF **A01**

NOAA-81100801
Preliminary Estimates of Wind Power Potential at the Nevada Test Site.
PB82-127036 1183 PC **A02**/MF **A01**

NORDITA-78-19
Quantization of the Axial Current for the Massless Rarita-Schwinger Field.
NORDITA-78-19 1261 PC **A02**/MF **A01**

NOSC/TR-681
Source Ranging by a Single Array in a Multipath Ocean.
AD-A106 988/9 1232 PC **A02**/MF **A01**

NOSC/TR-695
Accuracy of High Frequency Maximum Usable Frequencies (MUF) Prediction.
AD-A107 097/8 1264 PC **A07**/MF **A01**

NOSC/TR-717
Maximum Likelihood Estimation of Magnitude-Squared Coherence.

NTIS ORDER/REPORT NUMBER INDEX

AD-A107 352/7 1197 PC **A02/MF A01**

NOSC/TR-724

A Program to Compute ELF/VLF Earth-Ionosphere Modal Height Gains via WKB Methods up to Satellite Altitudes.
AD-A107 517/5 1264 PC **A06/MF A01**

NP-1902593

Solid-Fuel Cooking Stoves: Bibliography.
NP-1902593 1201 PC **A03/MF A01**

NP-1902598

High Temperature Thermal Insulation Usage in UK Process Industries.
NP-1902598 1201 PC **A02/MF A01**

NP-1902600

Energy-Resource Requirements of a Solar-Heating System.
NP-1902600 1201 PC **A04/MF A01**

NPRDC-TR-82-4

Mathematics Curricula Requirements and Performance Levels in Navy Class 'C' Electronics Schools.
AD-A106 995/4 1106 PC **A03/MF A01**

NPS/WAC-81/18

Project Lame 80F: A Cultural Resource Survey Around Boulder Beach, Echo Bay, Temple Bar and Cottonwood Cove in the Lake Mead National Recreation Area Clark County, Nevada and Mohave County, Arizona.
PB82-109364 1104 PC **A08/MF A01**

NPS52-81-014

The Automatic Generation of Syntax Directed Editors.
AD-A107 078/8 1171 PC **A03/MF A01**

NPS-54-81-006

The Role of the Armed Forces in the Mexican Economy in the 1980's.
AD-A107 509/2 1097 PC **A06/MF A01**

NPS55-81-014

Estimation of Sensor Detection Probabilities with Data from Concurrent Sensors.
AD-A107 443/4 1178 PC **A03/MF A01**

NPS55-81-016

Effect of Operator Mental Loading on Voice Recognition System Performance.
AD-A107 477/2 1234 PC **A04/MF A01**

NPS55-81-017

Effect of Task Duration on Voice Recognition System Performance.
AD-A107 442/6 1104 PC **A04/MF A01**

NPS55-81-019

Enhancing Technology Transfer of Computer Hardware and Software Architectures Using Human Factors in Initial Design.
AD-A107 444/2 1104 PC **A02/MF A01**

NPS-67-81-01CR

Multistage Axial Compressor Program on Tip Clearance Effects.
AD-A107 445/9 1270 PC **A03/MF A01**

NPS-67-81-02CR

Model of Direct Initiation of Unconfined Detonations.
AD-A107 446/7 1251 PC **A02/MF A01**

NPS67-81-009

Performance of an Oswatisch Inlet with Hemispherical Centerbody at Zero Angle of Attack.
AD-A107 439/2 1270 PC **A05/MF A01**

NPS67-81-012

Modeling Solid-Fuel Ramjet Combustion Including Radiation Heat Transfer to the Fuel Surface.
AD-A107 441/8 1270 PC **A03/MF A01**

NRC-19643

Cutting Ice with High Pressure Water Jets--Translation.
AD-A106 985/5 1169 PC **A03/MF A01**

NRL-MR-4180

Ion Beam Propagation in a Filamented Channel.
NRL-MR-4180 1240 PC **A02/MF A01**

NRL-MR-4213

Tokamak Heating and Current Maintenance with Intense Pulsed Ion Beams.
NRL-MR-4213 1240 PC **A04/MF A01**

NRL-MR-4605

An Aerosol Data Base Format.
AD-A107 032/5 1083 PC **A02/MF A01**

NRL-MR-4612

The Lower-Hybrid-Drift Instability in Non-Antiparallel Reversed Field Plasmas.
AD-A107 269/3 1084 PC **A03/MF A01**

NRL-MR-4638

Field Experiments with Artificial Aerosols at San Nicolas Island, California.
AD-A107 270/1 1084 PC **A03/MF A01**

NRL-8504

High Solitary Waves in Water: A Refined Numerical Method.
AD-A107 041/6 1156 PC **A02/MF A01**

NRL-8505

High Solitary Waves in Water: Results of Calculations.
AD-A107 267/7 1253 PC **A02/MF A01**

NRL-8516

Atmospheric Turbulence as a Function of Height above Various Surface Materials.
AD-A107 034/1 1085 PC **A02/MF A01**

NRL-8541

Linear Frequency Modulation Derived Polyphase Pulse-Compression Codes and an Efficient Digital Implementation.
AD-A107 268/5 1238 PC **A02/MF A01**

NRTC-80-10R

Device Development Program for Efficient Excitation of a Blue-Green Laser.
AD-A107 073/9 1255 PC **A05/MF A01**

NSF/CEE-81039

Inference Procedure with Uncertainty for Problem Reduction Method,
PB82-131772 1198 PC **A03/MF A01**

NSF/CEE-81044

TLUSH: A Computer Program for the Three-Dimensional Dynamic Analysis of Earth Dams,
PB82-139940 1216 PC **A06/MF A01**

NSF/PRA-81004

Technological Innovation and Problem-Solving in Local Government: An Assessment of Current Research Methods.
PB82-128620 1091 PC **A12/MF A01**

NSF/PRA-81005

Technological Innovation and Problem-Solving in Local Government: An Assessment of Current Research Methods, Executive Summary.
PB82-128638 1091 PC **A02/MF A01**

NSF/PRA-81006

Multiple Perspective Concept with Applications to Technology Assessment and Other Decision Areas.
PB82-128604 1091 PC **A16/MF A01**

NSF/PRA-81007

The Multiple Perspective Concept with Applications to Technology Assessment and Other Decision Areas (Condensed Version),
PB82-128612 1091 PC **A05/MF A01**

NSF/PRM-81001

Recent Research Reports, Entries 1320-1540: Bibliography.
PB82-132846 1096 PC **A06/MF A01**

NSF/RA-780913

Recent Awards: October-December 1978.
PB82-131921 1095 PC **A02/MF A01**

NSF/RA-780915

Differential PCM Systems,
PB82-132804 1178 PC **A03/MF A01**

NSF/RA-780916

Engineering Aspects of Gradient-Index Optical Systems.
PB82-131996 1256 PC **A07/MF A01**

NSF/RA-780918

Machine Intelligence Research Applied to Industrial Automation.
PB82-133075 1222 PC **A07/MF A01**

NSF/RA-800368

Industrial Program Grantee Conference. Proceedings of a Conference Held at Hot Springs, Arkansas, May 12-14, 1980.
PB82-132168 1092 PC **A09/MF A01**

NSF/RA-800597

Twenty-Five Innovations from Abroad.
PB82-138322 1093 PC **A03/MF A01**

NSF/RA-800605

Natural Hazards Observer Index. Volume 1, Number 1-Volume 4, Number 3.
PB82-132663 1114 PC **A02/MF A01**

NSF/RA-800620

Applied Research Summary of Awards, Fiscal Year 1980.
PB82-132671 1092 PC **A04/MF A01**

NSF/SES-81005

Development of Compatible State - SMSA Econometric Models.
PB82-133497 1099 PC **A08/MF A01**

NSF/SES-81006

Development of Compatible State - SMSA Econometric Models: Appendices.
PB82-133505 1099 PC **A11/MF A01**

NSF-80-92

Applied Research Summary of Awards, Fiscal Year 1980.
PB82-132671 1092 PC **A04/MF A01**

NSF-81-68

Recent Research Reports, Entries 1320-1540: Bibliography.
PB82-132846 1096 PC **A06/MF A01**

NSWC/TR-80-319

Pore Size, Zinc Penetration, and Zinc Diffusion Studies on PPQ/CA Separators.
AD-A107 354/3 1187 PC **A03/MF A01**

NSWC/TR-81-17

Battery Separators Based on Polyphenylquinoxaline Polymer Blends.
AD-A107 130/7 1195 PC **A03/MF A01**

NSWC/TR-81-94

Use of Foam to Reduce Gun Blast Noise Levels.
AD-A107 081/2 1251 PC **A05/MF A01**

NSWC/TR-81-184

NAVPAC SST Data Processing--Mathematical Description.
AD-A107 082/0 1171 PC **A03/MF A01**

NTIA/REPORT-81-84

Selective Fading on a Long 8 GHz Line-of-Sight Path in Europe.
PB82-130519 1235 PC **A05/MF A01**

NTIA-TM-81-59

A high-Frequency Broadband Transmitter for Monostatic Systems.
AD-A107 088/7 1238 PC **A05/MF A01**

NTSB-RAR-81-3

Railroad Accident Report: Brief Format Number 5, 1979.
PB82-128091 1210 PC **A03/MF A01**

NTSB-RAR-81-4

Railroad Accident Report: Brief Format Issue Number 1, 1980.
PB82-128109 1210 PC **A08/MF A01**

NTSB-SEE-81-4

Safety Effectiveness Evaluation: Federal Highway Administration Non-Interstate Resurfacing, Restoration, and Rehabilitation Program.
PB82-131699 1212 PC **A03/MF A01**

NUREG/CR-1241-V4

LWR Pressure Vessel Irradiation Surveillance Dosimetry.
NUREG/CR-1241-V4 1246 PC **A06/MF A01**

NUREG/CR-1589

Pathfinding Simulation (PATHS) User's Guide,
NUREG/CR-1589 1249 PC **A08/MF A01**

NUREG/CR-2106

1/5-Scale Countercurrent Flow Data Presentation and Discussion.
NUREG/CR-2106 1248 PC **A03/MF A01**

NUREG/CR-2146-V1

Dynamic Analysis to Establish Normal Shock and Vibration of Radioactive Material Shipping Packages.
NUREG/CR-2146-V1 1242 PC **A03/MF A01**

NUREG/CR-2182-V1

Station Blackout at Browns Ferry Unit One - Accident Sequence Analysis,
NUREG/CR-2182-V1 1248 PC **A11/MF A01**

NUREG/CR-2195

Transportation of Radioactive Material in South Carolina.
NUREG/CR-2195 1243 PC **A03/MF A01**

NUREG/CR-2227

Radioactive Materials Released from Nuclear Power Plants.
NUREG/CR-2227 1246 PC **A09/MF A01**

NUREG/CR-2313

Boundary-Fitted Coordinate Transformation for Thermohydraulic Analysis in Arbitrary Three-Dimensional Geometries,
NUREG/CR-2313 1197 PC **A03/MF A01**

NUREG/CR-2390

German Standard Problem 4a.
NUREG/CR-2390 1248 PC **A08/MF A01**

NUREG/CR-2411

Regional Tectonics and Seismicity of Eastern Nebraska.
NUREG/CR-2411 1168 PC **A06/MF A01**

NUREG/CR-2418

Durability of Simulated Supercalcine Ceramics at Geologic Storage Conditions.
NUREG/CR-2418 1245 PC **A08/MF A01**

NUREG-0857

Operation of Palo Verde Nuclear Generating Station, Units 1, 2, and 3; Docket Nos. STN-50-528, STN 50-529, and STN 50-530, Arizona Public Service Company, et al.
NUREG-0857 1248 PC **A21/MF A01**

NUREG-0862-ISSUE 1

Seismic Related Errors at Diablo Canyon Nuclear Power Plant, Units 1 and 2. Docket Nos. 50-275 and 50-323, License Nos. CPPR-39 and CPPR-69, Pacific Gas and Electric Company.
NUREG-0862-ISSUE 1 1248 PC **A03/MF A01**

NUSC-TR-6010

Underwater Target Tracking Using Measurements from a Linear Array of Omnidirectional Acoustic Elements.
AD-A107 070/5 1232 PC **A04/MF A01**

NVO-192(V.1)

Selected Environmental Plutonium Research Reports of the NAEG.
NVO-192(V.1) 1246 PC **A15/MF A01**

NVO-1555-5

Development of Fluorides for High Power Laser Optics. Final Report, 1 April 1978-31 March 1980.
NVO-1555-5 1255 PC **A04/MF A01**

NVO-1558-5(V.2)

Atlantic Coastal Plain Geothermal Test Holes, North Carolina. Hole Completion Reports.
NVO-1558-5(V.2) 1166 PC **A06/MF A01**

NWC-TM-4650

How to Make TIGER Perform: A Supplementary Operator's Manual for the TIGER Code.
AD-A106 822/0 1251 PC **A03/MF A01**

NYSDOT-ERD-73-RR-18

Acceptance Sampling of Steel Reinforcing Bars.
PB82-135690 1220 PC **A03/MF A01**

O-492-206-81-04

Mission Operation Report: Rca-D/delta Launch.
N82-11102/2 1273 PC **A03/MF A01**

ONRL-C-4-81

9th Scientific Meeting of the International Epidemiological Association.

AD-A107 471/5 1124 PC **A02**/MF **A01**

ONRL-C-7-81

International Symposium on Nuclear Techniques in the Study and Control of Parasitic Diseases of Man and Animals.
AD-A107 302/2 1123 PC **A02**/MF **A01**

ONRL-C-8-81

Third National Reliability Conference Birmingham, England.
AD-A107 449/1 1173 PC **A02**/MF **A01**

ONRL-C-9-81

Biophysics of Water: A Working Conference.
AD-A107 336/0 1120 PC **A02**/MF **A01**

ONRL-R-5-81

A Technical Assessment of Aeronautical Engineering in Israel.
AD-A106 980/6 1075 PC **A02**/MF **A01**

ONWI-95

Review of Current Capabilities for the Measurement of Stress, Displacement, and in Situ Deformation Modulus.
ONWI-95 1158 PC **A05**/MF **A01**

OPEN FILE-81-583

A Summary of Environmental Geologic Studies on the Southeastern United States Atlantic Outer Continental Shelf, 1977-1978.
PB82-109273 1158 PC **A03**/MF **A01**

OPM/OLMR-82/1

Digest of Labor Arbitration Awards in the Federal Service (Supplement No. 10).
PB82-128257 1109 PC **A07**/MF **A01**

ORAU/IEA-80-2(M)

Social Control of Energy: A Case for the Promise of Decentralized Solar Technologies.
ORAU/IEA-80-2(M) 1182 PC **A03**/MF **A01**

ORAU/IEA-80-10(M)

Stochastic Sun: Understanding the Intermittent Resource.
ORAU/IEA-80-10(M) 1182 PC **A04**/MF **A01**

ORAU-168

Coal Mine Labor Productivity: Mine-Level Data from Pike County, Kentucky, and Other Selected Counties.
ORAU-168 1166 PC **A04**/MF **A01**

ORNL/CON-43

Theory and Design of an Annual Cycle Energy System (ACES) For Residences.
ORNL/CON-43 1201 PC **A16**/MF **A01**

ORNL/CON-53

Energy Use in Minnesota Public Buildings: Data Management and Analysis.
ORNL/CON-53 1182 PC **A03**/MF **A01**

ORNL/CSD-85

Preliminary Internal Data Screening - a Component of Quantitative Data Analysis in Data Validation.
DE81000502 1095 PC **A03**/MF **A01**

ORNL-MIT-213

Cocurrent Three-Phase Fluidized Bed. Part 2.
ORNL-MIT-213 1265 PC **A04**/MF **A01**

ORNL/NUREG/TM-455/V1

Station Blackout at Browns Ferry Unit One - Accident Sequence Analysis,
NUREG/CR-2182-V1 1248 PC **A11**/MF **A01**

ORNL/OIAPA-13

Public Information on Radioactive Waste: A Study of an Emerging Issue.
ORNL/OIAPA-13 1245 PC **A04**/MF **A01**

ORNL/SUB-79/13837/1

State of the ART Review of Alternatives to Shallow Land Burial of Low Level Radioactive Waste.
ORNL/SUB-79/13837/1 1245 PC **A06**/MF **A01**

ORNL/SUB-79/45740/1

Worldwide Transportation/Energy Demand, 1975-2000. Revised Variflex Model Projections.
ORNL/SUB-79/45740/1 1183 PC **A09**/MF **A01**

ORNL/SUB-7317/1

Cogeneration Feasibility Study in the Gulf States Utilities Service Area.
ORNL/SUB-7317/1 1187 PC **A23**/MF **A01**

ORNL/SUB-7317/2

Cogeneration Institutional Study in the Geismar, LA, and Orange, Texas Areas.
ORNL/SUB-7317/2 1187 PC **A09**/MF **A01**

ORNL/SUB-7384/1

Comparative Cost Estimates of Five Coal Utilization Processes.
ORNL/SUB-7384/1 1209 PC **A12**/MF **A01**

ORNL/SUB-7470/1-V3

Economic Evaluation of the Annual Cycle Energy System (ACES). Final Report. Volume III, Appendices.
ORNL/SUB-7470/1-V3 1183 PC **A18**/MF **A01**

ORNL/SUB-7494/3

Fuel Utilization Improvements in a Once-Through PWR Fuel Cycle. Final Report on Task 6.
ORNL/SUB-7494/3 1248 PC **A03**/MF **A01**

ORNL/TM-6253

Summary of the Research and Development Effort on Open-Cycle Coal-Fired Gas Turbines.
ORNL/TM-6253 1270 PC **A07**/MF **A01**

ORNL/TM-6264

Partial Thermal Denitration of Uranyl Nitrate Solutions in a Screw Denitrator.
ORNL/TM-6264 1249 PC **A03**/MF **A01**

ORNL/TM-6428

ORNL Direct Purchase Information System (DPIS) User's Manual.
ORNL/TM-6428 1090 PC **A06**/MF **A01**

ORNL/TM-6626/V1

Assessment of an Atmospheric Fluidized-Bed Coal-Combustion Gas-Turbine Cogeneration System for Industrial Application.
ORNL/TM-6626/V1 1187 PC **A09**/MF **A01**

ORNL/TM-6970

Materials Analyses of Ceramics for Glass Furnace Recuperators.
ORNL/TM-6970 1190 PC **A06**/MF **A01**

ORNL/TM-6977

State Flows of Energy in 1975.
ORNL/TM-6977 1183 PC **A19**/MF **A01**

ORNL/TM-7003

Molten Carbonate Fuel Cell Program. Progress Report for Period January 1-March 31, 1979; EMF And Temperature Relaxation in LiKCO sub 3 Tiles; Transference Cell Measurements.
ORNL/TM-7003 1187 PC **A02**/MF **A01**

ORNL/TM-7049

Tokamak Blanket Design Study, Final Report.
ORNL/TM-7049 1240 PC **A09**/MF **A01**

ORNL/TM-7232

Fossil Energy Materials Needs Assessment.
ORNL/TM-7232 1193 PC **A07**/MF **A01**

ORNL/TM-7297

Research on Noneconomic Factors Relevant to the Diffusion of Solar Total Energy Systems.
ORNL/TM-7297 1183 PC **A05**/MF **A01**

ORNL/TM-7360

Calculation of Neutron and gamma Ray Energy Spectra for Fusion Reactor Shield Design: Comparison with Experiment.
ORNL/TM-7360 1240 PC **A03**/MF **A01**

ORNL/TM-7405

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ORNL/TM-7589

Development of Depletion Perturbation Theory for a Reactor Nodal Code.
DE81030695 1247 PC **A08**/MF **A01**

ORNL/TM-7893

Socioeconomic Assessment of Defense Waste Processing Facility Impacts in the Savannah River Plant Region.
DE82000522 1244 PC **A07**/MF **A01**

ORNL/TM-7910

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DE81030702 1247 PC **A03**/MF **A01**

ORNL/TM-7911

Monte Carlo Simulation of Molecular Flow in a Neutral-Beam Injector and Comparison with Experiment.
DE82000503 1239 PC **A03**/MF **A01**

ORNL-5398(EXEC.SUM.)

Interim Assessment of the Denatured exp 233 U Fuel Cycle: Feasibility and Nonproliferation Characteristics.
ORNL-5398(EXEC.SUM.) 1248 PC **A04**/MF **A01**

ORNL-5616

Metallurgical and Mechanical Properties of Thorium-Doped Ir-0.3% W Alloys.
ORNL-5616 1193 PC **A02**/MF **A01**

ORNL-5629

ORNL Coal Chemistry Report, 1979. Executive Summary.
ORNL-5629 1138 PC **A12**/MF **A01**

ORNL-5766

Proposed New Handbook for the Federal Emergency Management Agency: Radiation Safety in Shelters.
DE82000441 1230 PC **A07**/MF **A01**

ORNL-5802

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ORO-1797-98

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DE81030542 1150 PC **A02**/MF **A01**

ORO-2832-213

Radiation and Biophysical Studies on Cells and Viruses. Progress Report, September 1, 1979-June 15, 1980.
ORO-2832-213 1143 PC **A05**/MF **A01**

ORO-3054-T3(APP.G)

SRC-I Coal Refinery. Task 1, Appendix G. General Construction Specifications.
ORO-3054-T3(APP.G) 1147 PC **A18**/MF **A01**

ORO-3852-36

Plutonium in the Gulf of Mexico.
ORO-3852-36 1246 PC **A03**/MF **A01**

ORO-3852-37

Uranium and Thorium Series Nuclides in River Sediments and River Water.
ORO-3852-37 1246 PC **A03**/MF **A01**

ORO-3852-38

Uranium and Thorium Series Isotopes in Nearshore Marine Sediments.
ORO-3852-38 1246 PC **A02**/MF **A01**

ORO-3852-39

Distribution of Actinide Elements in Sediments: Leaching Studies.
ORO-3852-39 1156 PC **A03**/MF **A01**

ORO-4207-13

Sixteenth Progress Report of the Texas A and M University Nuclear Science Center, January 1, 1979-December 31, 1979.
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ORP/SEPD-81-1

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PB82-131517 1143 PC **A02**/MF **A01**

OWRT-C-00086-G-0426(1)

Federal Water Resources Research: A Review of the Proposed Five-Year Program Plan.
PB82-135559 1214 PC **A05**/MF **A01**

P-102-4

Passive-Solar Retrofit Concepts.
DE82000453 1200 PC **A03**/MF **A01**

P-103-2

Passive-Solar Multi-Family Concepts.
DE82000456 1200 PC **A05**/MF **A01**

PAD-82-12

A Systematic Management Approach Is Needed for Congressional Reporting Requirements.
PB82-137753 1096 PC **A04**/MF **A01**

PANA-04

Theoretical Investigation of Absorptive Processes.
AD-A107 278/4 1253 PC **A02**/MF **A01**

PASS-6-1

Laser-Matter Interaction.
AECL-6343 1260 PC **A07**/MF **A01**

PAT-APPL-6-009 623

Perfluorocarbon Vapor Tagging of Blasting Cap Detonators.
PATENT-4 256 038 1250 Not available NTIS

PAT-APPL-6-137 095

Directional gamma Detector.
PATENT-4 259 575 1241 Not available NTIS

PAT-APPL-6-222 936

Four Input Coincidence Detector.
PAT-APPL-6-222 936 1241 PC **A02**/MF **A01**

PAT-APPL-6-267 178

Real-Time 3D X-Ray and gamma-Ray Viewer.
PAT-APPL-6-267 178 1179 PC **A02**/MF **A01**

PAT-APPL-6-276 748

Active Lamp Pulse Driver Circuit.
PAT-APPL-6-276 748 1179 PC **A02**/MF **A01**

PAT-APPL-6-276 764

Energy Efficient Lumber Dry Kiln Using Collectors and Refrigeration System.
PAT-APPL-6-276 764 1196 PC **A02**/MF **A01**

PAT-APPL-6-284 286

Solar Energy Modulator.
PAT-APPL-6-284 286 1183 PC **A02**/MF **A01**

PAT-APPL-6-284 287

Synthetic Aperture Radar Target Simulator.
PAT-APPL-6-284 287 1236 PC **A02**/MF **A01**

PAT-APPL-6-284 289

Radiative Cooler.
PAT-APPL-6-284 289 1201 PC **A02**/MF **A01**

PAT-APPL-6-288 197

Motorized Wheel Chair.
PAT-APPL-6-288 197 1140 PC **A02**/MF **A01**

PAT-APPL-6-293 412

Method of Neutralizing the Corrosive Surface of Amine-Cured Epoxy Resins.
PAT-APPL-6-293 412 1195 PC **A02**/MF **A01**

PAT-APPL-6-297 486

Gas Levitator and Method for Containerless Processing.
PAT-APPL-6-297 486 1224 PC **A02**/MF **A01**

PAT-APPL-6-301 075

Cooling by Conversion of Para to Ortho-Hydrogen.
PAT-APPL-6-301 075 1152 PC **A02**/MF **A01**

PAT-APPL-6-301 077

Tuned Analog Network.
PAT-APPL-6-301 077 1179 PC **A02**/MF **A01**

PAT-APPL-6-308 007

High Temperature Glass Thermal Control Structure and Coating.
PAT-APPL-6-308 007 1190 PC **A02**/MF **A01**

PAT-APPL-6-308 009

Focal Axis Resolver for Offset Reflector Antennas.
PAT-APPL-6-308 009 1179 PC **A02**/MF **A01**

PAT-APPL-6-308 203

Improved Constant-Output Atomizer.
PAT-APPL-6-308 203 1225 PC **A02**/MF **A01**

NTIS ORDER/REPORT NUMBER INDEX

PAT-APPL-864 696
Toroidal Magnet System.
PATENT-4 263 096 1171 Not available NTIS

PAT-APPL-886 370
Mirror Plasma Apparatus.
PATENT-4 260 455 1240 Not available NTIS

PAT-APPL-931 098
Method for Continuous Ambulatory Peritoneal Dialysis.
PATENT-4 239 041 1140 Not available NTIS

PATENT-4 239 041
Method for Continuous Ambulatory Peritoneal Dialysis.
PATENT-4 239 041 1140 Not available NTIS

PATENT-4 256 038
Perfluorocarbon Vapor Tagging of Blasting Cap Detonators.
PATENT-4 256 038 1250 Not available NTIS

PATENT-4 259 575
Directional gamma Detector.
PATENT-4 259 575 1241 Not available NTIS

PATENT-4 260 455
Mirror Plasma Apparatus.
PATENT-4 260 455 1240 Not available NTIS

PATENT-4 263 096
Toroidal Magnet System.
PATENT-4 263 096 1171 Not available NTIS

PB81-928110
Directory of Soviet Officials: Republic Organizations.
PB81-928110 1095 PC **E13**/MF **A01**

PB81-929905
Selected Aspects of Cancer-Related Proteins, Carbohydrate, Lipid, and Other Biochemistry.
PB81-929905 1120 Not available NTIS

PB82-100033
Occupational Injuries and Illnesses, Virgin Islands, 1979.
PB82-100033 1139 MF **A01**

PB82-100041
Occupational Injuries and Illnesses, Idaho, 1979.
PB82-100041 1139 MF **A01**

PB82-100058
Occupational Injuries and Illnesses, Wisconsin, 1979.
PB82-100058 1139 MF **A01**

PB82-104969
A Methodology for Evaluating Housing in Use: A Case Study Approach,
PB82-104969 1113 PC **E04**/MF **A01**

PB82-105909
Current Status of EPA Office of Mobile Source Air Pollution Control Characterization Projects: Summary.
PB82-105909 1269 PC **A04**/MF **A01**

PB82-106428
Tallahassee-Leon County Wastewater Management, Tallahassee, Leon County, Florida.
PB82-106428 1209 PC **A10**/MF **A01**

PB82-106436
Techniques for Analyzing the Performance of Rural Transit Systems. Volume I.
PB82-106436 1221 PC **A06**/MF **A01**

PB82-106816
Optimal Control of a Network of Whole Blood Banks: Target Inventory Levels for a Hospital Blood Bank or a Decentralized Regional Blood Banking System.
PB82-106816 1130 PC **A03**/MF **A01**

PB82-106832
Fire Department Participation in the Identification and Transportation of Victims of Thermal Injury 'In Central New York State' Exploratory Study.
PB82-106832 1130 PC **A03**/MF **A01**

PB82-106873
Directory of Information for Dynamometer Testing of 1979-1981 Light Duty Motor Vehicles,
PB82-106873 1221 PC **A04**/MF **A01**

PB82-107103
Industrial Hygiene Survey Report at Celotex Corporation, Pittston, Pennsylvania.
PB82-107103 1139 PC **A05**/MF **A01**

PB82-107137
Androscoggin River Basin Overview.
PB82-107137 1160 PC **A09**/MF **A01**

PB82-107145
Piscataqua and New Hampshire Coastal River Basins Overview.
PB82-107145 1160 PC **A08**/MF **A01**

PB82-107178
Asbestos Dust and Preliminary Industrial Hygiene Survey at World-Bestos, the Firestone Tire and Rubber Company in New Castle, Indiana.
PB82-107178 1139 PC **A02**/MF **A01**

PB82-107186
Men's Apparel Industrywide Study at Gant Shirtmakers Division of Consolidated Foods, Salisbury, MD.
PB82-107186 1139 PC **A02**/MF **A01**

PB82-107194
Industrial Hygiene Survey Report at U.S. Gypsum Corporation, Birmingham, Alabama.
PB82-107194 1139 PC **A04**/MF **A01**

PB82-107202
Results of Air Samples of Johns-Manville in Marshville, North Carolina.
PB82-107202 1139 PC **A02**/MF **A01**

PB82-107210
Health Hazard Evaluation Report No. HE-79-80, 81-746, at Cobe Laboratories, Inc., Lakewood and Arvada, Colorado,
PB82-107210 1139 PC **A02**/MF **A01**

PB82-107228
Health Hazard Evaluation Report No. HE-79-14-760 at General Electric Company, Evendale,Ohio,
PB82-107228 1140 PC **A02**/MF **A01**

PB82-107236
Health Hazard Evaluation Report No. HE-80-159-752 at Mountain Bell, Denver, Colorado,
PB82-107236 1140 PC **A03**/MF **A01**

PB82-107244
Chloroacetaldehyde (Analytical Method S11).
PB82-107244 1140 PC **A02**/MF **A01**

PB82-107251
Prevention of Low Back Injury in the Industrial Work Force: Symposium Held at Cincinnati, Ohio on November 9, 1972.
PB82-107251 1140 PC **A02**/MF **A01**

PB82-107269
Men's Apparel Industrywide Study: Fechheimer Bros. Co., Cincinnati, Ohio.
PB82-107269 1140 PC **A02**/MF **A01**

PB82-107285
On-Site GC/MS Analysis of Chapman Gasification Separator Liquor.
PB82-107285 1152 PC **A03**/MF **A01**

PB82-107293
Monoterpenes of Lodgepole Pine Phloem as Related to Mountain Pine Beetles.
PB82-107293 1081 PC **A02**/MF **A01**

PB82-107319
The Activity Fuel Appraisal Process: Instructions and Examples.
PB82-107319 1081 PC **A04**/MF **A01**

PB82-107327
The Cooperative Coal Marketing Arrangement in Eastern Kentucky: A Feasibility Report.
PB82-107327 1098 PC **A03**/MF **A01**

PB82-107335
Remote Automatic Weather Station for Resource and Fire Management Agencies.
PB82-107335 1087 PC **A02**/MF **A01**

PB82-107509
Forest Policy Project Module III-A: Timber Supply Analysis and Baseline Simulations.
PB82-107509 1081 PC **A10**/MF **A01**

PB82-107517
Saco and Southern Maine Coastal River Basins Overview.
PB82-107517 1210 PC **A09**/MF **A01**

PB82-107525
Patient Tracking for High Blood Pressure Control.
PB82-107525 1130 PC **A06**/MF **A01**

PB82-107533
Summary and Recommendations: Conference on Pacific and Asian American Families and HEW-Related Issues.
PB82-107533 1113 PC **A13**/MF **A01**

PB82-107566
Treatability Studies of Pesticide Manufacturing Wastewaters: Ethylenebisdithiocarbamate Fungicides.
PB82-107566 1210 PC **A05**/MF **A01**

PB82-107723
Compilation of Air Pollutant Emission Factors, Third Edition, Supplement 12.
PB82-107723 1210 PC **A09**/MF **A01**

PB82-107863
Questions and Responses at the 1981 Workshops on Procedures to Demonstrate Attainment of the NAAQS (National Ambient Air Quality Standards) for Ozone in the 1982 SIPs (State Implementation Plans).
PB82-107863 1210 PC **A03**/MF **A01**

PB82-107871
Permit Fee Guideline.
PB82-107871 1210 PC **A03**/MF **A01**

PB82-107889
Anatomy and Assessment of Program Planning at the National Eye Institute,
PB82-107889 1091 PC **A06**/MF **A01**

PB82-108044
An Analysis of Markovian Model Microfield Methods for Stark Broadening.
PB82-108044 1152 Not available NTIS

PB82-108085
Forest Policy Project Module IV A: Socioeconomic Impact Assessment and Module IV B: Environmental Impact Assessment.
PB82-108085 1081 PC **A15**/MF **A01**

PB82-108093
Design Criteria for Avalanche Control Structures in the Runout Zone.
PB82-108093 1169 PC **A03**/MF **A01**

PB82-108101
Lake Memphremagog-St. Francis River Basin Overview.
PB82-108101 1160 PC **A08**/MF **A01**

PB82-108614
An Analysis of Research Publications Supported by NIH (National Institutes of Health) 1970-1976: NIH and NCI (National Cancer Institute).
PB82-108614 1130 PC **A03**/MF **A01**

PB82-108838
Wastewater Facilities Southern Region Area, Palm Beach County, Florida.
PB82-108838 1210 PC **A09**/MF **A01**

PB82-109125
Alternative Forest Policies for the Pacific Northwest: Study Module V.
PB82-109125 1082 PC **A18**/MF **A01**

PB82-109273
A Summary of Environmental Geologic Studies on the Southeastern United States Atlantic Outer Continental Shelf, 1977-1978.
PB82-109273 1158 PC **A03**/MF **A01**

PB82-109364
Project Lame 80F: A Cultural Resource Survey Around Boulder Beach, Echo Bay, Temple Bar and Cottonwood Cove in the Lake Mead National Recreation Area Clark County, Nevada and Mohave County, Arizona,
PB82-109364 1104 PC **A08**/MF **A01**

PB82-109406
Size and Sex Ratio of King Mackerel, 'Scomberomorus cavalla', in the Southeastern United States.
PB82-109406 1121 PC **A04**/MF **A01**

PB82-109422
Architectural and Historical Survey on Approximately 121,265 Acres in Central North Dakota.
PB82-109422 1104 PC **A16**/MF **A01**

PB82-109430
Proposed Gulf of Mexico OCS Oil and Gas Sales 67 and 69.
PB82-109430 1210 PC **A14**/MF **A01**

PB82-109570
The Resilient and Plastic Characteristics of Michigan Subgrade Soils and Their Soil Support Values.
PB82-109570 1170 PC **A16**/MF **A01**

PB82-109851
User's Manual for Factor-Jump Thermogravimetry Apparatus, and Associated Programs, Including a General Plotting Program,
PB82-109851 1229 PC **A17**/MF **A01**

PB82-109901
Coal Cooperative Efficiency Program: Small Mine Operations.
PB82-109901 1166 PC **A14**/MF **A01**

PB82-110214
Self-Evaluation for Rape-Responsive Organizations. Volume II: A Self-Evaluation Guide for Programs Serving Victims of Rape.
PB82-110214 1130 PC **A08**/MF **A01**

PB82-110222
Self-Evaluation for Rape-Responsive Organizations. Volume III: A Self-Evaluation Guide for Rape-Responsive Community Education Programs.
PB82-110222 1131 PC **A07**/MF **A01**

PB82-110230
Self-Evaluation for Rape-Responsive Organizations. Volume IV: A Self-Evaluation Guide for Rape Responsive Training Programs.
PB82-110230 1131 PC **A03**/MF **A01**

PB82-115932
Epidemiologic Study of Rocky Mountain Fever (RMSF).
PB82-115932 1131 PC **A02**/MF **A01**

PB82-118209
Inductively Coupled Plasma-Atomic Emission Spectrometric Analysis of Environmental Samples Using Ultrasonic Nebulization.
PB82-118209 1229 PC **A02**/MF **A01**

PB82-118894
Acclimation Temperature: An Important Factor Influencing the Interaction of Chlorine, delta T and Exposure Duration to Eggs, Prolarvae and Larvae of Striped Bass, 'Morone saxatilis',
PB82-118894 1145 PC **A04**/MF **A01**

PB82-120635
The United States-Japan Cooperative Cancer Research Program Progress Report, April 1980 through March 1981.
PB82-120635 1131 PC **A07**/MF **A01**

PB82-121740
INFO: The JHU/APL Information Package.
PB82-121740 1174 CP **T14**

PB82-121757
INFO: The JHU/APL Information Package Manual.
PB82-121757 1174 PC **A23**/MF **A01**

PB82-121765
Patch Macro and Load Module (IRSPATCH).
PB82-121765 1174 CP **T03**

PB82-121773
COBOL Analysis and Translate System (CATS).
PB82-121773 1174 CP **T14**

PB82-121781
COBOL Analysis and Translate System (CATS). Technical Note.
PB82-121781 1175 PC **A12**/MF **A01**

PB82-121799
Methods and Standards System.
PB82-121799 1091 CP **T11**

PB82-121807
Methods and Standards System. Computer Operation Manual.
PB82-121807 1091 PC **A04**/MF **A01**

PB82-121815
File Analysis and Selection Technique (FAST).
PB82-121815 1095 CP **T05**

PB82-121823
File Analysis and Selection Technique (FAST). Users Manual.
PB82-121823 1095 PC **A09**/MF **A01**

PB82-121831
Label Utility System.
PB82-121831 1095 CP **T03**

PB82-121849
Label Utility System.
PB82-121849 1095 PC **A05**/MF **A01**

PB82-121856
CLMTIC3 - Tally Incidence of Characters.
PB82-121856 1175 CP **T03**

PB82-121864
COPY3 - Copy Sequential Data Sets.
PB82-121864 1175 CP **T02**

PB82-121872
Plotting Routines NOMEN and CLINE.
PB82-121872 1175 Mag Tape $95.00

PB82-121880
COBOL Structured Code Analyzer.
PB82-121880 1175 CP **T05**

PB82-121898
DSMS Update System.
PB82-121898 1095 CP **T05**

PB82-121906
DSMS Update System, User's Guide.
PB82-121906 1095 PC **A02**/MF **A01**

PB82-121914
EEO System.
PB82-121914 1109 CP **T05**

PB82-121922
EEO Statistics. Computer Operation Manual.
PB82-121922 1109 PC **A04**/MF **A01**

PB82-121930
COBOL Audit and Debugging Aid (CADA INSERT).
PB82-121930 1175 CP **T05**

PB82-121948
COBOL Audit and Debugging Aid (CADA INSERT). Technical Note.
PB82-121948 1175 PC **A04**/MF **A01**

PB82-124405
Use of Fuel Oil by Stationary Sources in California.
PB82-124405 1183 PC **A08**/MF **A01**

PB82-124413
An Evaluation of the New York Area Sampling Frame.
PB82-124413 1080 PC **A02**/MF **A01**

PB82-125907
State-Local Policy Management Project.
PB82-125907 1091 PC **A05**/MF **A01**

PB82-126293
Atmospheric Benzene Depletion by Soil Microorganisms.
PB82-126293 1170 PC **A02**/MF **A01**

PB82-126319
Tethered Balloon Sampling Systems for Monitoring Air Pollution.
PB82-126319 1210 PC **A02**/MF **A01**

PB82-126533
A Preliminary Examination of EDA Feasibility Studies.
PB82-126533 1091 PC **A02**/MF **A01**

PB82-127036
Preliminary Estimates of Wind Power Potential at the Nevada Test Site.
PB82-127036 1183 PC **A02**/MF **A01**

PB82-127267
Project RMAG: SLANG (Structured Language) Compiler,
PB82-127267 1175 PC **A08**/MF **A01**

PB82-127358
Effects of Pollution on Freshwater Fish.
PB82-127358 1136 PC **A03**/MF **A01**

PB82-127432
Dopamine Depletion Slows Retinal Transmission.
PB82-127432 1142 PC **A02**/MF **A01**

PB82-127549
Methyl Parathion Persistence in Soil Following Simulated Spillage.
PB82-127549 1170 PC **A02**/MF **A01**

PB82-127960
Nitrosamines and Other Hazardous Emissions from Engine Crankcases.
PB82-127960 1210 PC **A02**/MF **A01**

PB82-128091
Railroad Accident Report: Brief Format Number 5, 1979.
PB82-128091 1210 PC **A03**/MF **A01**

PB82-128109
Railroad Accident Report: Brief Format Issue Number 1, 1980.
PB82-128109 1210 PC **A08**/MF **A01**

PB82-128117
Effects of Acid Precipitation in North America.
PB82-128117 1136 PC **A02**/MF **A01**

PB82-128158
Effect of Fluctuating Exposures on the Acute Toxicity of Ammonia to Rainbow Trout (Salmo gairdneri) and Cutthroat Trout (S. clarki).
PB82-128158 1145 PC **A02**/MF **A01**

PB82-128174
Marine and Estuarine Pollution.
PB82-128174 1136 PC **A03**/MF **A01**

PB82-128190
Influence of Drilling Muds on the Primary Chemosensory Neurons in Walking Legs of the Lobster, 'Homarus americanus'.
PB82-128190 1136 PC **A02**/MF **A01**

PB82-128257
Digest of Labor Arbitration Awards in the Federal Service (Supplement No. 10).
PB82-128257 1109 PC **A07**/MF **A01**

PB82-128489
Evergreen Point Bridge Maintenance Problems, 1980.
PB82-128489 1210 PC **A03**/MF **A01**

PB82-128505
Evergreen Point Bridge Maintenance Problems, 1977.
PB82-128505 1211 PC **A03**/MF **A01**

PB82-128604
Multiple Perspective Concept with Applications to Technology Assessment and Other Decision Areas.
PB82-128604 1091 PC **A16**/MF **A01**

PB82-128612
The Multiple Perspective Concept with Applications to Technology Assessment and Other Decision Areas (Condensed Version),
PB82-128612 1091 PC **A05**/MF **A01**

PB82-128620
Technological Innovation and Problem-Solving in Local Government: An Assessment of Current Research Methods.
PB82-128620 1091 PC **A12**/MF **A01**

PB82-128638
Technological Innovation and Problem-Solving in Local Government: An Assessment of Current Research Methods, Executive Summary.
PB82-128638 1091 PC **A02**/MF **A01**

PB82-128646
Convention on International Trade in Endangered Species of Wild Fauna and Flora; 1979 Annual Report for the United States of America.
PB82-128646 1098 PC **A10**/MF **A01**

PB82-128653
Windshield Damage and Driving Safety.
PB82-128653 1225 PC **A04**/MF **A01**

PB82-128679
BIGMAC: Basic Interactive Geothermal Model with Aquifer Characterization; A User's Guide,
PB82-128679 1183 PC **A04**/MF **A01**

PB82-128711
Floods on Big Creek in the Vicinity of La Follette, Tennessee.
PB82-128711 1211 PC **A03**/MF **A01**

PB82-128729
Multivariable Control of a Milling Circuit at East Driefontein Gold Mine,
PB82-128729 1166 PC **A04**/MF **A01**

PB82-128828
Finance Issues: County Highways and Public Transit.
PB82-128828 1091 PC **A03**/MF **A01**

PB82-128976
The Federal Side of Traditional Telecommunications Cost Allocations,
PB82-128976 1234 PC **A06**/MF **A01**

PB82-128984
The States Regulate Cable: A Legislative Analysis of Substantive Provisions,
PB82-128984 1234 PC **A07**/MF **A01**

PB82-128992
Taxation, Regionalization and Pole Attachments: A Comparison of State Cable Television Policies,
PB82-128992 1234 PC **A07**/MF **A01**

PB82-129008
The Regulation of Cable Television Subscriber Rates by State Commissions,
PB82-129008 1234 PC **A06**/MF **A01**

PB82-129016
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Thermal Conductivity of a Concrete Mortar from 95 K to 320 K,
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Vacation Farm Cooperatives,
PB82-134388 1080 PC **A02**/MF **A01**

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New Record of Introduced Hosts for the Mountain Pine Beetle in California.
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Preserving the Green Sale Value of Dying Ponderosa Pine with Lindane.
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Oak Management in California.
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USCGC GLACIER 1976 and 1978 Cruises. Rose Sea, Antarctica Sediment Descriptions,
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Recursive System Identification Using Fast Algorithms,
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Optimization of Stochastic Relay Control Systems by Means of Dimensional Analysis,
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A Review of Numerical Methods for the Analysis and Design of Soft Ground Tunnels,
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HOMEP - An Algorithm for Analysing Homogeneous Stress/Strain Histories,
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Control of Building Engineering Services. Part 1: Background,
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Control of Building Engineering Services. Part 2: A Survey of Proprietary Automation Systems,
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On-Lining an SDK-85 Microcomputer with a DEC System 10 for Down-Line Loading of Microcomputer Programs,
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Interactive Maximum Likelihood Estimation,
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Application of the Method of Inequalities to the Multivariable Control of Binary Distillation Columns,
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Computation of Abscissa of Stability by Repeated Use of the Routh Test,
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Comparison of the Caries-Preventive Effects of Neutral Sodium Fluoride and Acidulated Phosphate Fluoride.
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Peer Review,
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The Community Mental Health Project: Pilot Project.
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The Marketing of Alcoholic Beverages. Phase II: An Analytical Framework for Information About Marketing Practices and Consumer Purchasing of Beverage Alcohol Products,
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PB82-135286
The Marketing of Alcoholic Beverages. Phase I: Literature Report,
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Kielder Aqueduct Tunnels - Predicted and Actual Geology,
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Determining Optimum Routes from Maps,
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Yellow Bar Experimental Carriageway Markings - Accident Study,
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Site Investigation and Construction of the Cardiff Cable Tunnel,
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Reproducibility of Joint Spacing Measurements in Rock,
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Surface Dressing in Developing Countries: Research in Kenya,
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Some Planning Theories (Algunos Enfoques de Planeacion),
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Probabilistic Analysis of Seismic Response of Multi-Supported Structures on Soft Soils (Analisis Probabilistico de la Respuesta Sismica de Estructuras Sobre Varios Apoyos en Suelos Blandos),
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Design of Concrete Walls with Shear Failure (Diseno de Muros de Concreto Con Falla Por Cortante),
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Trusted Interval in the Fourier Spectra of Accelerograms Digitized Either Manually or by Semi-Automatic Means (Intervalo Confiable en el Espectro de Fourier Obtenido de Acelerogramas Digitizados Manualmente o Con Medios Semiautomaticos),
PB82-135393 1169 PC **A03**/MF **A01**

PB82-135401
Static Penetrometer for Soft and Loose Soils (Penetrometro Estatico Para Suelos Blandos Y Sueltos),
PB82-135401 1170 PC **A03**/MF **A01**

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Single-Room Heat Balance for Building Heat Transfer,
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New Formulations for the Method of Inequalities,
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Design Concepts for a Hierarchical Two Dimensional Multiprocessor Structure,
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PB82-135658
SYCOL: Informal Language Specification,
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PB82-135666
SYCOL: A High Level Language for Applications in Real Time Control Systems,
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Multivariable Pole Assignment Self Tuning Regulators,
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On the Behaviour of Dynamical Systems Subject to Bounded Disturbances,
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(Order as PB82-136029, PC A05/MF A01)

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(Order as PB82-136029, PC A05/MF A01)

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(Order as PB82-136029, PC A05/MF A01)

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PB82-136177

Evaluation of the Colorado Clinical Psychology/Expanded Mental Health Benefits Experiment. Volume III: Provider Questionnaire.
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PB82-136185

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Sludge Composting and Utilization: Rational Approach to Process Control.
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PB82-136367

NPDES Compliance Monitoring Inspector Training: Biomonitoring.
PB82-136367 1214 PC A05/MF A01

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NPDES Compliance Monitoring Inspector Training: Sampling Procedures.
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NPDES Compliance Monitoring Inspector Training: Laboratory Analysis.
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The Use of Self-Feeders in Fish Culture,
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Work Simplification Training Techniques and Materials.
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Handling and Transporting Juvenile American Shad,
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PB82-136623

Degassing Supersaturated Water for Fish Culture,
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PB82-136631

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Controlled Large-Scale Hatching of Brine Shrimp, 'Artemia salina',
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PB82-136656

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PB82-136755

Capabilities for a CODASYL Query Language.
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A Survey of CODASYL Query Languages.
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PB82-136953 1177 PC A03/MF A01

PB82-136961

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PB82-136995

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PB82-136995 1167 PC A13/MF A01

PB82-137027

Housing Demand Models and Housing Market Models for Regional and Local Planning,
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PB82-137035

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Behavior of a Nonconformal Mixture via Computer Simulation.
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PB82-137639
Field Study of Pile Group Action. Appendix A.
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PB82-137647
Field Study of Pile Group Action. Appendix B.
PB82-137647 1215 PC **A05**/MF **A01**

PB82-137654
Initial Toxicological Assessment of Ambush, Bolero, Bux, Dursban, Fentrifanil, Larvin, and Pydrin: Static Acute Toxicity Tests with Selected Estuarine Algae, Invertebrates, and Fish.
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Performance Tests for the Evaluation of Computerized Gas Chromatography/Mass Spectrometry Equipment and Laboratories.
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Mean Annual Streamflow of Selected Drainage Basins in the Coal Area of Southeastern Montana.
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Farm Sector Application of Flow-of-Funds Accounting.
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Organizational Socialization: Predictors of Commitment during and After Entry.
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PB82-859745
Plasma Solitons. 1972-1981 (Citations from the International Aerospace Abstracts Data Base).

PB82-859745 1261 PC **N01**/MF **N01**

PB82-859752
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PB82-859760
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PB82-859760 1223 PC **N01**/MF **N01**

PB82-859778
Electroplating of Copper. 1970-1981 (Citations from the NTIS Data Base).
PB82-859778 1223 PC **N01**/MF **N01**

PB82-859786
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PB82-859794
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PB82-859794 1223 PC **N01**/MF **N01**

PB82-859802
Automobile Tires. April, 1970-1981 (Citations from the Engineering Index Data Base).
PB82-859802 1222 PC **N01**/MF **N01**

PB82-859828
Triode AC Semiconductor Switch Circuits. 1974-1981 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
PB82-859828 1179 PC **N01**/MF **N01**

PB82-859836
Cold Setting Glue for Packaging. 1976-1981 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
PB82-859836 1189 PC **N01**/MF **N01**

PB82-859844
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PB82-859844 1220 PC **N01**/MF **N01**

PB82-859869
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PB82-859869 1241 PC **N01**/MF **N01**

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PB82-859893
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PB82-859893 1224 PC **N01**/MF **N01**

PB82-859919
Electrodeposition of Cobalt Base Alloys. 1966-1981 (Citations from the Metals Abstracts Data Base).
PB82-859919 1223 PC **N01**/MF **N01**

PB82-859927
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PB82-859935
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PB82-859935 1190 PC **N01**/MF **N01**

PB82-859943
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PB82-859943 1135 PC **N01**/MF **N01**

PB82-859950
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PB82-859968
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PB82-915200
Common Carrier Land Mobile Base Stations Cumulative Staff Study Listing.
PB82-915200 1236 Standing Order

PB82-923700
FDA Drug and Device Product Approvals.
PB82-923700 1142 Subscription

PES-397
Use of Fuel Oil by Stationary Sources in California.
PB82-124405 1183 PC **A08**/MF **A01**

PLRD-82-9
DOD Can Increase Revenues Through Better Use of Natural Resources It Holds in Trust.
PB82-134040 1213 PC **A03**/MF **A01**

PM TRADE-RE-0010
Simulated Tank Anti-Armor Gunnery System (STAGS).
AD-A107 481/4 1251 PC **A09**/MF **A01**

PN-AAH-878
Assessment of the Public Health Sector in Honduras, 1975-1985.
PB82-131095 1131 PC **A08**/MF **A01**

PNL-3512
Survey of Matrix Materials for Solidified Radioactive High-Level Waste.
DE82000708 1244 PC **A04**/MF **A01**

PNL-3954
Radiation Dose Rates from Commercial PWR and BWR Spent Fuel Elements.
DE82000697 1246 PC **A05**/MF **A01**

PPSP-MP-34
Investigation of Hydrodynamic and Behavioral Factors That Affect Zooplankton Sampling by Pumps.
PB82-137886 1122 PC **A05**/MF **A01**

PPSP/PPRP-47
Acclimation Temperature: An Important Factor Influencing the Interaction of Chlorine, delta T and Exposure Duration to Eggs, Prolarvae and Larvae of Striped Bass, 'Morone saxatilis'.
PB82-118894 1145 PC **A04**/MF **A01**

PPSP/UBLS-80-3
Oxygen Dynamics Study - Susquehanna River Below Conowingo Dam, Maryland: Volume I.
PB82-135971 1136 PC **A07**/MF **A01**

PPSP/UBLS-80-5
Susquehanna River Anadromous Fish Studies, Conowingo Dam to Havre De Grace, Maryland.
PB82-135963 1121 PC **A04**/MF **A01**

PRRL-81-CR-12
InGaAsP/InP Laser Development for Single-Mode, High-Data-Rate Communications.
N82-11452/1 1255 PC **A04**/MF **A01**

PSU-IRL-FR-81/1
Ionization and Aerosol Particulates in the Middle Atmosphere.
AD-A107 361/8 1084 PC **A02**/MF **A01**

PSU-TURBO-R81-3
Analytical and Experimental Study of Flow Phenomena in Noncavitating Rocket Pump Inducers.
N82-11031/3 1270 PC **A06**/MF **A01**

PUB-P-78-4
The States Regulate Cable: A Legislative Analysis of Substantive Provisions,
PB82-128984 1234 PC **A07**/MF **A01**

PUB-P-78-6
The Regulation of Cable Television Subscriber Rates by State Commissions,
PB82-129008 1234 PC **A06**/MF **A01**

PUB-P-78-7
The Economic Impact of State Cable TV Regulation,
PB82-129016 1235 PC **A05**/MF **A01**

PUB-P-78-8
Federal Preemption of State Regulation in Cable Television,
PB82-129024 1235 PC **A03**/MF **A01**

PUB-P-78-10
Chronology of Cable Television Regulation: 1947 - 1978,
PB82-129032 1235 PC **A03**/MF **A01**

PUB-P-78-11
Executive Summary of Findings of the State Cable Television Regulation Project,
PB82-129040 1235 PC **A02**/MF **A01**

PUB-P-79-1
The Role of Communications and Information Resources in Canada,
PB82-129057 1235 PC **A04**/MF **A01**

PUB-P-79-2
Revenue and Cost Allocations: Policy Means and Ends in the Railroad and Telecommunications Industries,
PB82-129065 1098 PC **A03**/MF **A01**

PUB-P-79-3
Private and Public Defenses Against Soviet Interception of U.S. Telecommunications: Problems and Policy Points,
PB82-129073 1235 PC **A04**/MF **A01**

PUB-P-79-4
The Exchange Network Facilities for Interstate Access (ENFIA) Interim Settlement Agreement: Using Governmentally Sanctioned Negotiating Processes to Coordinate Telecommunications Facilities and Services,
PB82-129099 1235 PC **A03**/MF **A01**

PUB/P-80-1
The Federal Side of Traditional Telecommunications Cost Allocations,
PB82-128976 1234 PC **A06**/MF **A01**

PUB-P-80-4
Compunications Network Management,
PB82-129081 1235 PC **A05**/MF **A01**

PUB-P-80-7
The Traditional State Side of Telecommunications Cost Allocations,
PB82-129107 1235 PC **A09**/MF **A01**

PWA-5515-162
JT8D High Pressure Compressor Performance Improvement.
N82-11467/9 1270 PC **A03**/MF **A01**

R80AEG058
Diagnostic and Condition Monitoring System Assessment for Army Helicopter Modular Turboshaft Engines.
AD-A107 315/4 1270 PC **A08**/MF **A01**

R-81-8
Survivability--The Effort and the Payoff.
AD-A107 108/3 1230 PC **A03**/MF **A01**

RAC-4285
Marketing Practices in the Alcoholic Beverages Industry: Toward an Understanding of How Macro-Environmental Forces Shape Marketing Strategies in the Alcoholic Beverage Industry. A Supplement to Phases I and II,
PB82-138579 1100 PC **A02**/MF **A01**

RADC/ETR-81-0016
Optical Processing of Photographic Images.
AD-A107 212/3 1230 PC **A02**/MF **A01**

RADC-TR-81-166
Propagation Study for a Tropospheric Transhorizon Radar.
AD-A107 039/0 1264 PC **A05**/MF **A01**

RADC-TR-81-215
Space-Based Radar Array System Simulation and Validation.
AD-A106 996/2 1238 PC **A06**/MF **A01**

RADC-TR-81-226
Ultra-Lightweight Mirror Manufacturing and Radiation Response Study.
AD-A106 998/8 1222 PC **A06**/MF **A01**

RADC-TR-81-243
Maui Optical Tracking and Identification Facility Transition Program.
AD-A106 997/0 1273 PC **A08**/MF **A01**

RAE-TM-AERO-1891
The Design of a 'Jet Catcher'.
AD-A106 968/1 1253 PC **A02**/MF **A01**

RAE-TM-MAT-358
Applications of the Microscan 9 Microanalyser.
AD-A106 969/9 1148 PC **A02**/MF **A01**

RAE-TM-MAT-375
A Basic Computer Program to Calculate Moisture Content in Resins and Fibre Reinforced Resin Composites.
AD-A106 970/7 1194 PC **A02**/MF **A01**

RAE-TM-SPACE-287
A True Air Speed Sensor for Miniature Unmanned Aircraft.
AD-A106 967/3 1079 PC **A02**/MF **A01**

RAND/N-731-ARPA
AUTOPILOT: A Distributed Planner for Air Fleet Control.
AD-A107 139/8 1236 PC **A03**/MF **A01**

RAND/N-1296-HUD
Relevance to HUD of Recent Scholarly Research in Urban Economics,
PB82-144452 1101 PC **A06**/MF **A01**

RAND/N-1309-HUD
Codebook for the Household Survey, Site I, Wave 3. Housing Assistance Supply Experiment,
PB82-144908 1119 PC **A99**/MF **A01**

RAND/N-1404-HUD
Audit of the Survey of Residential Buildings, Site I, Wave 2. Housing Assistance Supply Experiment,
PB82-144940 1119 PC **A05**/MF **A01**

RAND/N-1406-HUD
Audit of the Survey of Residential Buildings, Site I, Wave 3. Housing Assistance Supply Experiment,
PB82-144932 1119 PC **A03**/MF **A01**

RAND/R-2805-ARMY
Spatial Learning and Reasoning Skill.
AD-A107 345/1 1112 PC **A03**/MF **A01**

REPRINT-2479
A New High Pressure Equation of State for Seawater.
AD-A107 221/4 1168 Not available NTIS

REPRINT-2480
The Density of Caspian Sea Waters.
AD-A107 220/6 1168 Not available NTIS

REPRINT-2483
Apparent Molal Volumes and Adiabatic Compressibilities of Aqueous Transition Metal Chlorides at 25 c.
AD-A107 222/2 1149 Not available NTIS

REPRINT-2582
Adiabatic Partial Molal Compressibilities of Electrolytes in 0.725m NaCl Solutions at 25 c.
AD-A107 223/0 1149 Not available NTIS

REPT-995
Lightweight Diesel Engine Designs for Commuter Type Aircraft.
N82-11068/5 1271 PC **A04**/MF **A01**

REPT-351710-6028-UT-01
Radiation Testing of Composite Materials, in Situ Versus Ex Situ Effects.
N82-11116/2 1190 PC **A06**/MF **A01**

REPT-0189219-1-F
Time-Variable Earth's Albedo Model Characteristics and Applications to Satellite Sampling Errors.
N82-11723/5 1085 PC **A05**/MF **A01**

RESEARCH MONO-14-A
Employment and Unemployment Among Vietnam Era Veterans: An Analysis of the 1979 National Survey of Veterans,
PB82-136912 1110 PC **A03**/MF **A01**

NTIS ORDER/REPORT NUMBER INDEX

RFP-TRANS-297
Magnesium Hydroxide Neutron-Shielding Material and Method of Producing Such Material.
DE81030298 1242 PC **A02**/MF **A01**

RI/RD81-149
Advanced Superposition Methods for High Speed Turbopump Vibration Analysis.
N82-11465/3 1225 PC **A05**/MF **A01**

RI/RD81-199
Liquid Oxygen Turbopump Technology.
N82-11468/7 1225 PC **A12**/MF **A01**

RL-81-062
Control Panels - Layout and Design,
PB82-132051 1222 PC **A02**/MF **A01**

RL-81-072
Low-Temperature Theories of the Classical One-Dimensional Easy-Plane Ferromagnet: Successes and Limitations,
PB82-131665 1263 PC **A02**/MF **A01**

RL-81-073
Spin-Wave Damping in the Quantum Ising-Heisenberg Chain,
PB82-134149 1263 PC **A02**/MF **A01**

RL-81-074
Heat Energy Recovery from Domestic Output Fluids (HERDOF),
PB82-134156 1188 PC **A02**/MF **A01**

RL-81-076
COMPUMAG: Papers Presented by Members of the Laboratory at the Conference of the Computation of Electromagnetic Field, Chicago, 14-17 September, 1981,
PB82-134164 1253 PC **A03**/MF **A01**

ROAD NOTE-39
Recommendations for Road Surface Dressing.
PB82-132630 1219 PC **A03**/MF **A01**

RPI-MATH-131
Refracted Ray Characteristics from the Geometrical Spreading Equation for Depth-Dependent Media.
AD-A107 216/4 1252 PC **A02**/MF **A01**

RPT-006-007-REV-O
Marine Seismic System At-Sea-Test Deployment Operation. Revision.
AD-A106 991/3 1168 PC **A11**/MF **A01**

RR-5-SER-B
Technical Communication--Taking the User into Account.
AD-A107 030/9 1107 PC **A04**/MF **A01**

RR-81-3
A Validity Comparison of Adaptive and Conventional Strategies for Mastery Testing.
AD-A106 867/5 1106 PC **A03**/MF **A01**
A Comparison of Procedures for Constructing Large Item Pools.
AD-A107 364/2 1197 PC **A04**/MF **A01**

RR-81-4
The Use of the Sequential Probability Ratio Test in Making Grade Classifications in Conjunction with Tailored Testing.
AD-A107 367/5 1112 PC **A03**/MF **A01**

RR-81-5
The Formation of Homogeneous Item Sets When Guessing is a Factor in Item Responses.
AD-A107 134/9 1111 PC **A05**/MF **A01**

RSL/ENG-673/2
The Use of Applicative Programming in Data Processing.
PB82-136219 1176 PC **E02**/MF **E02**

RSL/ENG-673/5
A Reappraisal of the Use of IDMS for the Radcliffe Science Library Serials Handling System,
PB82-136227 1096 PC **E02**/MF **E02**

RSL-TR-410-2
A Model Describing the Microwave Emission from a Multi-Layer Snowpack at 37 Ghz.
N82-11510/6 1169 PC **A07**/MF **A01**

RSRE-MEMO-2875
'Pseudo', A Macro-Based High Level Language for the PDP-11,
AD-A107 168/7 1172 PC **A04**/MF **A01**

RTI-1671/01-02F
Support Services for Commercialization of Small Hydroelectric Facilities in North Carolina.
NCEI-0018 1186 PC **A10**/MF **A01**

RUTGERS/COOK/ES-81-1
Sludge Composting and Utilization: Rational Approach to Process Control.
PB82-136243 1269 PC **A10**/MF **A01**

SABS-809-1980
Standard Specification for Industrial Safety-Belt Assemblies.
N82-11278/0 1225 PC **A02**/MF **A01**

SABS-1304-1980
Standard Specification for Light Ladders.
N82-11277/2 1218 PC **A03**/MF **A01**

SABS-1312-1980
Standard Specification for Air-Brake Reservoirs.
N82-11464/6 1220 PC **A02**/MF **A01**

SABS-1317-1980
Standard Specification for Apparatus for gamma Radiography.
N82-11433/1 1228 PC **A02**/MF **A01**

SAC/LGME-ER-P-372
Alert Aircraft Roll Over Chocks.
AD-A107 456/6 1079 PC **A04**/MF **A01**

SAI-81-285
On the Design of Simulations of Command and Control Processes.
AD-A107 423/6 1108 PC **A07**/MF **A01**

SAI-81-285A
Some Guidelines for Effective Task Design in Command and Control Simulations.
AD-A107 424/4 1108 PC **A07**/MF **A01**

SAM-REVIEW-3-81
Proceedings of a Workshop on the Protection of Personnel against Radiofrequency Electromagnetic Radiation Held at the Royal Air Force Establishment, Farnborough, United Kingdom, 6-8 April 1981.
AD-A107 357/6 1143 PC **A11**/MF **A01**

SAM-TR-81-21
Optimal Staging and Scheduling in Airlift Operations.
AD-A107 518/3 1231 PC **A02**/MF **A01**

SAM-TR-81-28
Proceedings of a Workshop on the Protection of Personnel against Radiofrequency Electromagnetic Radiation Held at the Royal Air Force Establishment, Farnborough, United Kingdom, 6-8 April 1981.
AD-A107 357/6 1143 PC **A11**/MF **A01**

SAND-80-1626
Pathfinding Simulation (PATHS) User's Guide,
NUREG/CR-1589 1249 PC **A08**/MF **A01**

SAND-80-1879
Development of Analytical Tools for the Punch Investigation of the Transuranic Package Transporter (TRUPACT).
DE82000820 1242 PC **A04**/MF **A01**

SAND-81-0643
Guidance for Implementing an Environmental, Safety and Health Assurance Program. Volume 12. Model Guidelines for Line Organization Environmental, Safety and Health Inspection and Monitoring Activities.
DE81030991 1138 PC **A03**/MF **A01**

SAND-81-0644
Guidance for Implementing an Environmental, Safety and Health Assurance Program. Volume 13. Model Guidelines for Line Organization Environmental, Safety and Health Meetings.
DE81030980 1138 PC **A03**/MF **A01**

SAND-81-0978
Analysis and Leak Tests of Wells for New Solution Mined Caverns at the Bryan Mound DOE-SPR Storage Site.
DE82000244 1267 PC **A04**/MF **A01**

SAND-81-1156
Vertical Axis Wind Turbine Control Strategy.
DE81031932 1181 PC **A02**/MF **A01**

SAND-81-1188C
Experimental Source Term Data Base for Assessing the Safety of Spent Fuel Transportation.
DE81023692 1243 PC **A02**/MF **A01**

SAND-81-1232
Analysis of Data from Line-Source Thermal-Conductivity Measurements Taken in Situ in Dome Salt at the Avery Island Mine.
DE82000517 1157 PC **A05**/MF **A01**

SAND-81-1417C
Evaluation of Proposed Methods of Radioactive Material Container Tie-down Design for Truck Transport.
DE81024032 1242 PC **A02**/MF **A01**

SAND-81-1523C
Sensitivity Analysis of Transportation Parameters on Spent-Fuel-Cask Projections.
DE81025833 1243 PC **A02**/MF **A01**

SAND-81-1941C
Effect of Thermomechanical Properties on Initial Cavity Growth.
DE81030839 1161 PC **A02**/MF **A01**

SAND-81-1966C
Systems Studies of Waste Transportation.
DE81030840 1243 PC **A02**/MF **A01**

SAND-81-7034
Possible Effects of Government and Industry Standards on Photovoltaic Products Liability.
DE81031936 1186 PC **A03**/MF **A01**

SAND-81-7100-V.1
Intermediate Photovoltaic System Application Experiment Operational Performance: Executive Summary. Volume 1, for Newman Power Station, El Paso, TX.
DE81031934 1185 PC **A02**/MF **A01**

SAND81-7141
Geothermal Potential on Kirtland Air Force Base Lands, Bernalillo County, New Mexico.
AD-A107 044/0 1157 PC **A04**/MF **A01**

SAPR-1
Study of the Time Evolution of the Lithosphere.
N82-11696/3 1157 PC **A02**/MF **A01**

SAR-2
Theoretical Studies of Chromospheres and Winds in Cool Stars.
N82-12004/9 1082 PC **A02**/MF **A01**

SB-80
Terrorism; A Bibliography of Books and Periodical Articles.
AD-A107 291/7 1232 PC **A02**/MF **A01**

SB-677
Poultry Production, Disposition, and Income: Final Estimates for 1976-79.
PB82-133430 1080 PC **A02**/MF **A01**

SBIE-AD-F200-014
Carbon Dioxide Absorption Characteristics of High Performance Sodasorb at 1 Atmosphere.
AD-A107 488/9 1140 PC **A02**/MF **A01**

SC5055.21FR
A Study of Wall Jets and Tangentially Blown Wings.
AD-A106 986/3 1077 PC **A09**/MF **A01**

SCIENTIFIC-10
Electromagnetic Transmission through a Rectangular Aperture in a Perfectly Conducting Plane.
AD-A107 521/7 1264 PC **A03**/MF **A01**

SDC-TM-5261/003/00
Application of Tactical Data Systems for Training. Volume IV. Development of Courseware and Analysis of Results for GED Math.
AD-A107 530/8 1109 PC **A13**/MF **A01**

SDC-TM-5544/000/00
Utilization of Tactical Computers for Training: Analysis of System and Training Requirements.
AD-A107 531/6 1109 PC **A03**/MF **A01**

SDC-TM-5544/002/00
Utilization of Tactical Computers for Training: Field Evaluation Plan.
AD-A107 316/2 1108 PC **A03**/MF **A01**

SDC-TM-6257/000/00
Development of Data Processing Strategies for Potential Application in the Tactical Operations Systems (TOS) and Other Tactical Data Systems.
AD-A107 532/4 1232 PC **A08**/MF **A01**

SEFES-81-26
Biomass in Southeastern Forests.
PB82-133422 1082 PC **A03**/MF **A01**

SERI/TR-632-870
Near-Term Improvements in Parabolic Troughs: An Economic and Performance Assessment.
DE82001158 1200 PC **A04**/MF **A01**

SERI/TR-9190-1-T3
Investigation of Solar Cells Base on Cu sub 2 O. Final Progress Report, June 1, 1980-May 31, 1981.
DE81030274 1185 PC **A03**/MF **A01**

SLWM-81-3
Continuing Design Work for the Sierra Cooperative Pilot Project: Interim Report No. 4,
PB82-136607 1087 PC **A13**/MF **A01**

SOL-81-16
Variable Metric Relaxation Methods. Part I. A Conceptual Algorithm.
AD-A107 461/6 1199 PC **A06**/MF **A01**

SOLAR/0010-81/08
August 1981 Environmental Data for Sites in the National Solar Data Network.
DE82000071 1084 PC **A09**/MF **A01**

SR81-R-4861-15
High Temperature Metallic Recuperator.
PB82-141102 1202 PC **A07**/MF **A01**

SRD-81-076
Investigation for Low-Cost Permanent Magnets.
AD-A107 392/3 1171 PC **A03**/MF **A01**

SRI-8627
Synthesis of Energetic Polymers.
AD-A107 498/8 1147 PC **A04**/MF **A01**

SS-24-U3-181
Methods for Allocating Highway Costs.
PB82-130501 1211 PC **A05**/MF **A01**

SSS-R-80-4586
The Underwater Acoustic Signature of a Nuclear Explosion at the Ocean Surface.
AD-A107 359/2 1241 PC **A03**/MF **A01**

SSS-R-81-5033
Seismological Discrimination and Yield Determination Research.
AD-A107 360/0 1168 PC **A05**/MF **A01**

STAN-CS-81-855
Deductive Synthesis of the Unification Algorithm,
AD-A107 328/7 1173 PC **A04**/MF **A01**

STEWS-ID-81-2
IRIG-TIME Synchronized Binary Video Data Inserter.
AD-A107 119/0 1233 PC **A03**/MF **A01**

STUDY-P2795
A Survey of Citizen Views and Concerns About Urban Life.
PB82-141250 1115 PC **A13**/MF **A01**

SU-TF-13
Numerical Simulation of a Compressible Homogeneous, Turbulent Shear Flow.
N82-11396/0 1254 PC **A09**/MF **A01**

SU-TF-14
A Three-Dimensional Simulation of Transition and Early Turbulence in a Time-Developing Mixing Layer.
N82-11393/7 1254 PC **A07**/MF **A01**

SU-TF-15
Mixing of a Passive Scalar in Isotropic and Sheared Homogeneous Turbulence.
N82-11394/5 1254 PC **A08**/MF **A01**

SU-TF-16
Higher-Level Simulations of Turbulent Flows.
N82-11395/2 1254 PC **A08**/MF **A01**

T-111
Annual Progress Report.
AD-A106 983/0 1196 PC **A07**/MF **A01**

TAEG-108
Preparation and Design for a Training Effectiveness Evaluation of Device 2F64C for Replacement Pilot Training,
AD-A106 939/2 1106 PC **A05**/MF **A01**

TDA-PR-42-65
The Telecommunications and Data Acquisition Report.
N82-11279/8 1234 PC **A11**/MF **A01**

TM-81/1
Muzzle Flow in the Presence of an Anti-Recoil Plate: Exploratory Study.
AD-A107 314/7 1251 PC **A03**/MF **A01**

TOP-3-2-500
Weapon Characteristics.
AD-A107 310/5 1251 PC **A02**/MF **A01**

TOP-4-2-500
Ammunition Characteristics.
AD-A107 311/3 1250 PC **A02**/MF **A01**

TOP-5-2-619
Missile Safety Qualification of Short Range Air Defense (SHORAD) Missiles.
AD-A107 505/0 1232 PC **A03**/MF **A01**

TOXICOLOGY-SEP-7
Primary Dermal Irritation Potential of the Insect Repellent CHF1 and Its Components.
AD-A106 944/2 1144 PC **A02**/MF **A01**

TR-EE81-25
An Application of Syntactic Pattern Recognition to Seismic Discrimination,
AD-A107 383/2 1238 PC **A03**/MF **A01**

TR-J8101
Rank Correlation Coefficients as Optimality Measures for Ordinal Cluster Methods.
AD-A107 109/1 1196 PC **A02**/MF **A01**

TR-J8102
Cluster Analysis Algorithms for Image Segmentation.
AD-A107 110/9 1172 PC **A02**/MF **A01**

TR-J8103
A Model for Ordinal Nonhierarchical Cluster Methods.
AD-A107 111/7 1196 PC **A02**/MF **A01**

TR-1
Symmetry Extinction of LEED Beams for Naphthalene Adsorbed on Pt(III).
AD-A106 963/2 1148 PC **A02**/MF **A01**

TR-2
The Nature of the Phase Transition Observed for Monolayers of Azulene on Pt(III).
AD-A107 067/1 1148 PC **A02**/MF **A01**

TR-3
Chemisorption and Thermal Chemistry of Azulene and Naphthalene Adsorbed on Pt(III).
AD-A107 068/9 1148 PC **A03**/MF **A01**
On the Accuracy of Low-Energy Electron Diffraction.
AD-A107 332/9 1252 PC **A02**/MF **A01**
Cerebral Economics: Resource Competition within but not Between Hemispheres.
AD-A107 362/6 1112 PC **A03**/MF **A01**
Interpersonal Relations Among Hispanics in the United States: A Content Analysis of the Social Science Literature.
AD-A107 460/8 1113 PC **A13**/MF **A01**

TR-4
Technical Communication--Taking the User into Account.
AD-A107 030/9 1107 PC **A04**/MF **A01**

TR-5
Model Analysis of the Raman Spectrum from Fused Silica Optical Fibers.
AD-A106 938/4 1148 PC **A02**/MF **A01**
The Chemistry of Polyacetylene Doping.
AD-A107 165/3 1195 PC **A02**/MF **A01**

TR-6
Preparation and Characterization of Neutral and Oxidized Polypyrrole Films.
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Structure Study of Oxygen-Adsorbed Ni(111) Surface by High Energy Ion Scattering.
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TR-7
(13)C NMR of AsF5 Doped Polyacetylene.
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Effects of Temperature on Excited-State Descriptions of Luminescent Photoelectrochemical Cells Employing Tellrium-Doped Cadmium Sulfide Electrodes.
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TR-9
Estimation of the Homogenization Temperature of a 1.2 Polybutadiene/1.4 Polybutadiene Diblock Copolymer Using Rheological Testing Methods.
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TR-14
Laser-Stimulated Molecular Dynamics and Rate Processes.
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TR-15
Localized Necking: An Inclined Imperfection Model.
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TR-16
Lifetime Broadening of Excited Pyrazine Adsorbed on Ag(111).
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A Fracture Limit Diagram for Determining Hydrogen Embrittlement of Sheet under Multiaxial Loading Conditions.
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Quadratic-Exponential Moment Error Bounds for Digital Communication Systems.
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TR-20
The Use of Output Moments to Predict Performance of Nonlinear Systems with Gaussian Inputs.
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TR-38
Pentamethylcyclopentadienyl Cobaltaboranes Derived from the B5H8(-) and B9H14(-) Ions: Studies in Synthesis and Structure.
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Dynamic Crack Curving - A Photoelastic Evaluation.
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TR-42
Advances in Sample Introduction for Elemental Analysis.
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TR-60
Alaska OCS Socioeconomic Studies Program: St. George Basin and North Aleutian Shelf Commercial Fishing Industry Analysis.
PB82-139817 1122 PC **A22**/MF **A01**

TR-61
Alaska OCS Socioeconomic Studies Program: St. George Basin Petroleum Development Scenarios, Anchorage Impact Analysis.
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TR-67
Integrated Traffic Simulation Model - Phase I. Volume 1: Executive Summary.
PB82-139155 1215 PC **A03**/MF **A01**

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Integrated Traffic Simulation Model - Phase I. Volume 2: Design of the TRAF Operating System (TDS).
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Magnetomechanical Acoustic Emission--A New Method for Non-Destructive Stress Measurement.
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Vibrational Spectra of Oxygen- and Boron-Isotopically Substituted B2O3 Glasses.
AD-A107 333/7 1189 PC **A03**/MF **A01**

TR-81-5-T
Proceedings: Annual Gulf of Mexico Information Transfer Meeting (2nd) Held in New Orleans, Louisiana, 1980.
PB82-146333 1155 PC **A06**/MF **A01**

TR-81-6
Solitons in Polyacetylene: Effects of Dilute Doping on Optical Absorption Spectra.
AD-A106 964/0 1148 PC **A02**/MF **A01**

TR-81-7
Photoconductivity in Polyacetylene.
AD-A106 965/7 1194 PC **A02**/MF **A01**

TR-81-8
Inter-Soliton Electron Hopping Transport in Trans-(CH)x.
AD-A106 966/5 1263 PC **A02**/MF **A01**
Final Electromagnetic Test Report for the M10-76-8000 Radome with XP Plates.
AD-A107 404/6 1238 MF **A01**

TR-81-9
Soliton Formation and cis trans Isomerization in Polyacetylene.
AD-A107 274/3 1195 PC **A02**/MF **A01**

TR-81-10
Creation and Annihilation of Solitons, Radicals, and Ions in Polyacetylene as Related to the Mechanisms of Isomerization, Doping and Conduction.
AD-A107 122/4 1195 PC **A02**/MF **A01**

TR-81W-038
Design of an Evaluation of PSRO Long-Term Care Review.
PB82-131616 1132 PC **A08**/MF **A01**

TR-109-1
Statistical Research on Problems Associated with Navy Fire Protection and Fuel Technology Programs.
AD-A107 282/6 1225 PC **A02**/MF **A01**

TR-147
Properties of High-Efficiency X-Band GaAs Impatt Diodes.
AD-A107 043/2 1170 PC **A07**/MF **A01**

TR-230-2042
Space Shuttle Solid Rocket Booster Sting Interference Wind Tunnel Test Analysis.
N82-11040/4 1272 PC **A11**/MF **A01**

TRB/NCHRP/SYN-76
Collection and Use of Pavement Condition Data.
PB82-131970 1212 PC **A05**/MF **A01**

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Finance Issues: County Highways and Public Transit,
PB82-128828 1091 PC **A03**/MF **A01**

TRRL-LR-1001
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PB82-135310 1214 PC **A03**/MF **A01**

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DE81024032 1242 PC **A02**/MF **A01**

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Southeastern Soil Erosion Control and Water Quality Workshop, November 19-21, 1980, Nashville, Tennessee.
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The Use of Output Moments to Predict Performance of Nonlinear Systems with Gaussian Inputs.
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Minimum Weight Design of Flat Sandwich Panels under Edgewise Compression Loads.
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UDR-TR-80-134
Finite Element Techniques for Static Stress and Free Vibration Analysis of Sandwich Composites.
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UH-511-328-79
Study of Neutrino-Produced Dimuons Using the Fermilab 15-Foot Bubble Chamber and External Muon Identifier.
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Properties of Antilock Systems: Descriptive Parameters Used in Analyzing the Braking and Handling of Heavy Trucks. Volume 5.
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Windshield Damage and Driving Safety.
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When the Grand Tour's a Grind,
AD-A106 818/8 1143 PC **A02**/MF **A01**

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Standard Engineering Installation Package. Air Traffic Radio Channel Control Equipment Change 1.
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USAFA-TR-80-5
Digital Signal Sorting for Digitized Speech in an Environment of Common Digital Data Signals.
AD-A107 266/9 1233 PC **A03**/MF **A01**

USAMBRDL-TR-8109
Competitive Pathways in Chlorine Dioxide Oxidation of Amines: Amide Formation from Acyclic Amines.
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USARIEM-M-2/82
Isometric, Isotonic, and Isokinetic Torque Variations in Four Muscle Groups through a Range of Joint Motion.
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Aids to Navigation Principal Findings on the CAORF Experiment. The Performance of Visual Aids to Navigation as Evaluated by Simulation.
AD-A107 045/7 1236 PC **A08**/MF **A01**

USCG-D-59-80
Simulator Evaluation of Electronic Radio Aids to Navigation Displays--The Miniexperiment.
AD-A107 072/1 1236 PC **A06**/MF **A01**

USCG-D-59-81
Accelerated Stress Testing of Solar Photovoltaic Modules.
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USCG-373-74
Oceanography of the Grand Banks Region of Newfoundland, March 1974 - October 1974.
AD-A107 452/5 1169 PC **A10**/MF **A01**

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USGS-WDR-LA-3
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USGS/WRD/HD-80/059
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USGS/WRD/HD-81/082
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Water Resources Data for Indiana, Water Year 1980.
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Water-Resources Information for the Withlacoochee River Region, West-Central Florida.
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Borehole Data-Collection Methods Applicable for the Regional Observation and Monitor Well Program, Southwest Florida Water Management District.
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USGS/WRD/WRI-81-095
Simulated Interactions between the Proposed Narrows Reservoir and the Water-Table Aquifer Along the South Platte River, Morgan County, Colorado.
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Effect of Irrigation Pumping on the Ground-Water System in Newton and Jasper Counties, Indiana.
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Mean Annual Streamflow of Selected Drainage Basins in the Coal Area of Southeastern Montana.
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USGS/WRD/WRI-81-099
Selected Hydrologic Relationships for Soldier Creek, Northeastern Kansas.
PB82-138751 1160 PC **A04**/MF **A01**

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Simulated Interactions between the Proposed Narrows Reservoir and the Water-Table Aquifer Along the South Platte River, Morgan County, Colorado.
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Selected Hydrologic Relationships for Soldier Creek, Northeastern Kansas.
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USGS/WRI-81-11
Water-Resources Information for the Withlacoochee River Region, West-Central Florida.
AD-A106 929/3 1159 PC **A07**/MF **A01**

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Effect of Irrigation Pumping on the Ground-Water System in Newton and Jasper Counties, Indiana.
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Borehole Data-Collection Methods Applicable for the Regional Observation and Monitor Well Program, Southwest Florida Water Management District.
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Mean Annual Streamflow of Selected Drainage Basins in the Coal Area of Southeastern Montana.
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UTRC/R81-925261-14
Development of an Electronic Interface for a Fiber Optic Interferometric Sensor.
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UVA/525322/MS81/108
Model for the Elongation of Boron on Tungsten during Chemical Vapor Deposition.
AD-A106 989/7 1191 Not available NTIS

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The Community Mental Health Project: Pilot Project.
PB82-135252 1132 PC **A05**/MF **A01**

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Peer Review,
PB82-135237 1132 PC **A04**/MF **A01**

VA/NPR-149
Evaluation of the Program of Nursing Services,
PB82-136920 1134 PC **A04**/MF **A01**

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Work Simplification Training Techniques and Materials.
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VSC-TR-81-24
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W82-01051
Federal Water Resources Research: A Review of the Proposed Five-Year Program Plan.
PB82-135559 1214 PC **A05**/MF **A01**

WA-RD-44.1
Evergreen Point Bridge Maintenance Problems, 1980.
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Evergreen Point Bridge Maintenance Problems, 1977.
PB82-128505 1211 PC **A03**/MF **A01**

WAOENG-80-16
Proceedings of the Geothermal Symposium: Potential, Legal Issues, Economics, Financing.
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ORNL/SUB-7494/3 1248 PC **A03**/MF **A01**

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Proceedings, 15th Annual Meeting, Aquatic Plant Control Research Planning and Operations Review, held 17-20 November 1980, Savannah, Georgia.
AD-A107 083/8 1155 PC **A22**/MF **A01**

WES/MP/EL-81-8
Site Characterization for the MBCE/DIRT II Battlefield Environment Tests.
AD-A107 338/6 1236 PC **A04**/MF **A01**

WES/MP/SL-81-27
Structural Stability Evaluation, Winnibigoshish Dam.
AD-A107 337/8 1205 PC **A04**/MF **A01**

WES/MP/SL-81-28
Tensile Tests on Articulated Concrete Mattress Specimens.
AD-A107 422/8 1218 PC **A04**/MF **A01**

WES/MP/SL-81-29
Evaluation of Tests for Determining the Pumpability of Concrete Mixtures.
AD-A107 524/1 1218 PC **A04**/MF **A01**

WES/TR/HL-81-9
Investigation of Release Temperatures for Kinzua Dam, Allegheny River, Pennsylvania. Hybrid Model Investigation.
AD-A106 974/9 1204 PC **A04**/MF **A01**

WHOI-81-73
A Compilation of Moored Instrument Data and Associated Hydrographic Observations. Volume XXVIII (Polymode Local Dynamics Experiment, 1978-1979).
PB82-139411 1156 PC **E04**/MF **A01**

WHOI-81-98
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